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Held in Brighton on July 23rd, 24th, and 25th.

PROCEEDINGS OF SECTIONS.

SECTION OF STATE MEDICINE.

E. W. HOPE, M.D., D.Sc., President.

PRESIDENT'S INTRODUCTORY REMARKS.

IN the unavoidable absence of Dr. HOPE, the proceedings of the Section were briefly opened by one of the Vice-Presidents, Dr. W. A. BOND, M.O.H. for Holborn.

DISCUSSION ON PORT SANITARY ADMINISTRATION:

ESPECIALLY WITH A VIEW TO THE PREVENTION OF THE INTRODUCTION OF INFECTIOUS DISEASE.

OPENING PAPER.

By HERBERT WILLIAMS, M.D.Lond., D.P.H.Camb.,
Medical Officer of Health, Port of London.

THE United Kingdom being dependent on countries situated overseas for a large proportion of its food supply and also for its commercial prosperity, constant communication with all parts of the world by means of its mercantile marine is a natural consequence.

In many parts of the world the standard of hygiene is lower than it is in this country, and certain infectious diseases are endemic there. The sailors of our mercantile marine, when landing in foreign ports after a long voyage, are not always quite discreet in the manner of taking their recreation or in their choice of places where such are to be found, whilst the inhabitants of some countries are quite indifferent, or even opposed, to the taking of any precautionary measures in connexion with infectious diseases.

In some places abroad people have been seen walking about the streets with the scabs of small-pox still upon their faces. They do not feel ill, and therefore see no necessity for being isolated, whilst cases of plague and cholera are often concealed, and sanitary officers receive active opposition in the pursuance of their duties.

The conditions on board ship are particularly favourable to the spread of certain infectious diseases. For example, should a sailor have been infected with small-pox, his first symptoms are usually a headache and shivering accompanied by pain in his back. These symptoms are such as will ensure him little sympathy or consideration, and he may be living amongst his fellow seamen for three or four days before the appearance of a rash excites suspicion and leads to his isolation, and then he has probably infected all the susceptible persons with whom he has been in contact. The same remarks may also apply to passengers unless the ship's surgeon has had some knowledge of this disease, and causes the passenger to be isolated on suspicion. Quite recently three generations of small-pox occurred on a vessel without the ship's surgeon diagnosing the nature of the disease.

On every ship, measured by any standard of accommodation allowed ashore, there is overcrowding. The ventilation is insufficient even in the passengers' cabins, where the port holes may not be opened, and they communicate, either directly by spaces above the partitions or indirectly through the medium of the alley-way.

The following is a description of the accommodation provided for seamen in many of the cargo boats. The fore part of the main deck of the vessel is usually allotted to their use. This is divided into two spaces by a longitudinal partition, that on one side being devoted to the seamen and that on the other to the firemen. Each of these spaces should be provided with a ventilator. If, as in many cases, it is situated over a bunk, it is in consequence closed by the occupant of the bunk. The space is usually lighted by three 8-in. ports, equivalent to three small windows about 7 in. square. Seventy-two cubic feet of space is allowed to each person as a minimum. In some vessels 120 is provided, but in either case two bunks fill up at least 72 cubic feet. The bunks, being usually situated at the side of the vessel, obstruct the light so that the floor and the greater part of the space is in darkness. The men keep their clothes, oilskins, sea-boots, etc., in this space. They also take their meals there, and in some boats their supply of food is stored in lockers in their quarters.

The light, being insufficient, is commonly supplemented by a cheap form of oil lamp, smoky and evil-smelling. It is warmed by a cheap form of stove, which is often defective, allowing fumes and smoke to escape into the quarters. Such are the conditions under which many of the seamen of our mercantile marine spend their lives whilst afloat.

The sanitary conveniences are of a most primitive type; iron troughs without any provision for flushing are general. These, of course, become caked with excrement, and at the end of a voyage may be termed unapproachable. What they are like in the tropics may best be left to the imagination. It is small wonder that pulmonary tuberculosis is so common amongst seamen, the conditions under which they live being particularly favourable to the development and spread of this disease.

The drinking water on vessels may have been taken in from a source infected with cholera or enteric fever, or water from a similarly polluted source may have been drunk by persons before embarking, and such persons may develop these diseases in the course of the voyage. Certain ports are known to be particularly dangerous in regard to these two diseases, and arrivals therefrom are always treated with special attention.

Rats on board ship may be infected with plague; they may die and the infection be spread from the rat to human beings through the agency of fleas. Certain kinds of mosquitos may have bitten persons suffering from yellow fever, and in view of the fact that these mosquitos retain the organisms of this disease within their bodies for a period of many days, infection of persons might take place over a considerable period of time. Ballast tanks filled in a port where the water is infected with cholera organisms, and emptied in a port from which the water is drawn for drinking purposes, are another source of danger. The outbreak of cholera in Hamburg in 1892–3 was attributed to this cause.

The legal powers for dealing with ships at ports of arrival are conferred by the Public Health Act, 1875, the Public Health (London) Act of 1891, and the Public Health Act, 1896. These Acts require that any person on board suffering from infectious disease should be notified. This, in practice, is done by the surgeon of the ship, where one is carried, but the legal responsibility rests upon the person in charge of the ship—in other words, the master.

There is little difficulty in getting information as to the existence of infectious disease on vessels where a surgeon is carried; but the master of a vessel cannot be expected to diagnose every case of infectious disease, and if he were desirous of hiding the existence of infectious disease, he could, and probably would, always shelter himself under the excuse that he was not a medical man and did not know that it was a disease of an infectious nature.

The principal port sanitary authorities also possess by-laws requiring the master of any vessel having a case of a dangerous infectious disorder on board to "bring to" on arrival in a port, and to send notice of the fact to the medical officer of health of the port sanitary authority, who thereupon boards the vessel. The master is required to land the case at a specified hospital, and the medical officer will take such measures as he deems necessary for the disinfection of the quarters occupied by the patient, and any other articles which in his opinion are infected; but here again the master is supposed to be capable of diagnosing a dangerous infectious disorder.

Regulations have been issued by the Local Government Board for dealing with the dangerous infectious epidemic diseases known as plague, yellow fever, and cholera. These regulations were issued on September 9th, 1907, and it is probable that they will be revised shortly in

accordance with the provisions of the International Sanitary Convention held at Paris, 1911-12. This provides that the following measures should be taken at ports and on maritime frontiers.

Plague.

Ships are divided into three classes: Infected, suspected, healthy.

An "infected ship" is one in which a case of plague, yellow fever, or cholera has occurred within seven days of the arrival of the vessel at a port.

A "suspected ship" is one in which a case has occurred either in the port of departure or during the voyage, but not within a period of seven days preceding arrival.

A "healthy ship" is one which has come from an infected port, but where no case has occurred during the voyage.

The following are the precautions laid down with regard to plague:

1. Medical inspection of all persons on board.

2. Any person suffering from this disease shall be disembarked and isolated.

3. All contacts and all persons with any suspicious symptoms shall also be disembarked. These shall be kept under observation or surveillance. "Observation" means isolation of travellers, either on board the vessel or in a sanitary station, before they obtain free *pratique*. This is equivalent to the former detention of "quarantine."

"Surveillance" means that the travellers are not isolated. If healthy they receive free *pratique* immediately, but the authorities of the places whither they are proceeding are informed of their coming, and they are subjected to medical examination with a view to ascertaining the state of their health. In the case of an infected ship observation or surveillance may be imposed upon persons arriving on a vessel, but in the case of suspected or healthy ships surveillance only is permitted, and in the case of a healthy ship such surveillance is not to exceed a period of five days from the date of departure of the vessel from an infected port.

4. Linen and wearing apparel belonging to the crew or passengers which are, in the opinion of the sanitary authority, infected shall be efficiently disinfected.

5. Quarters occupied by the patient or by any who may be considered to be infected shall be disinfected.

6. The rats must be destroyed on infected or suspected vessels, and this may be done on healthy vessels if they come from infected ports. When rats on a healthy ship have been shown by bacteriological examination to have plague they must be destroyed, even though there may be no evidence of plague amongst the human beings on board. Precautions should be taken against rats going ashore, and it is recommended that ships be fumigated every six months for the destruction of rats. Vessels which are so fumigated may be granted preferential treatment in the port of arrival. Fumigation of ships is by pumping in a lethal gas, either CO, CO_2, SO_2, or a mixture of these gases. The gas should destroy not only the rats but also the fleas and other insects.

Cholera.

The precautions to be taken are practically the same as those in the case of plague, omitting the reference to rats. If the drinking water on board is suspected it shall be disinfected, pumped out, and replaced by a wholesome supply. The water ballast may be disinfected, but the better plan is to put some concentrated disinfectant in the ballast tanks before filling them in infected ports. This will ensure that they contain a non-infected water, which may be discharged without fear in the port of arrival. Provision is also made for the bacteriological examination of the excreta of contacts and suspicious cases, but this must be done within five days of the time of arrival; such bacteriological examination may also be made in the case of vessels that are in an insanitary condition and overcrowded. It is needless to say that this would mean a very troublesome and lengthy process, especially in the case of vessels carrying large numbers of passengers.

Yellow Fever.

1. Vessels arriving which are infected are also subjected to medical inspection.

2. The sick shall be disembarked, and shall be protected from the bites of mosquitos and isolated on shore.

3. Other persons may be disembarked and kept under surveillance. Persons who are engaged in unloading the vessel must be kept under surveillance for a period of six days.

4. Ships must be moored at least 200 metres from the shore.

5. The ship should be fumigated with a view to the destruction of mosquitos on board before unloading the vessel. The disease being carried by the *Stegomyia* mosquito, such precautions would practically only be employed in countries where this mosquito exists.

CONCLUSIONS.

1. The sanitary conditions on board ship can be and should be improved. At the present time ships are built and inspected and the living accommodation on board passed by officers of the Board of Trade who have had no training in sanitary work. It is no uncommon thing for new ships, on arriving in the Port of London, to be subjected to considerable alterations, with a view to making the conditions of life on board more bearable. In many instances not even the instructions issued by the Board of Trade to their surveyors have been carried out.

2. Under the present Local Government Board regulations a vessel may arrive from a port infected with plague, yellow fever, or cholera, and any persons may leave the vessel before arriving at the port—before the visit of the officer of customs or the medical officer—without any offence being committed. It is therefore possible under the present regulations that persons in the incubation stage of one of these diseases may come ashore, develop, and spread the disease at the place of arrival.

3. Small-pox has been prevalent during the present winter at many ports in Spain. Vessels usually arrive in this country from Spain within fourteen days of departure. Should the persons on board be well at the time of arrival, they are allowed to land, and no powers are possessed to take their names and addresses with a view to keeping them under surveillance. It is obvious that such persons, landing in apparently good health, may develop small-pox in the next two or three days, and form centres for the outbreak of this disease, and many instances may be noted where this has actually occurred.

Bearing in mind the increasing number of persons in this country who are unprotected by vaccination, it is, in my opinion, desirable that powers should be possessed for dealing with persons arriving on vessels from ports at which small-pox is known to exist. They should be required to give their names, and addresses to which they are proceeding, and in default they should be detained on board, whilst a heavy penalty should be imposed on those who give wrong names and addresses.

I have dealt in this paper with the side of port sanitary administration concerned only with the introduction of infectious disease, but port sanitary administration covers many other subjects, as, for instance, sanitary supervision of vessels, and especially the examination of foodstuffs. Many port sanitary authorities feel very strongly that their work is of an imperial rather than a local nature, and is effective for the protection of the whole country, and that, therefore, the expenses they have to incur in connexion with the inspection of vessels and foodstuffs, should be met by an imperial contribution, and should not be a charge borne entirely by the port. In the case of the Port of London, it is laid down in the Public Health (London) Act that any expense in connexion with the work of the Port of London Sanitary Authority shall be paid out of the corporate funds of the Corporation of the City of London, and this is done at an annual cost of between £10,000 and £11,000, which is paid for out of the City's cash, and not one penny of this amount falls upon the ratepayers of the City of London.

DISCUSSION.

Major JACKSON, R.A.M.C., referred to the introduction of yellow fever into Jamaica, and said that the question of the diagnosis of this disease was most important. There were some ports where the conditions under which sailors

had to exist on land were just as bad as those which Dr. Williams had described at sea, owing to inefficient sanitation and neglect of flushing of waterclosets. He thought that the sanitation on board ships was decided by financial considerations; but in his opinion it was the duty of the Government to see that the necessary reforms in this direction were carried out.

Mr. F. A. FOY (Port Health Officer, Rangoon) said he could endorse all the points brought forward by Dr. Williams so far as they came within his experience. With reference to the cases of small-pox that recurred one after the other, he recalled a similar instance of three successive cases of chicken-pox which occurred on the same steamer on her homeward and outward voyage, each of which appeared to have had a distinct connexion with the previous case. He agreed that it was a wrong principle to leave the reporting of cases of infectious disease to the masters of vessels which carried no medical officer, and believed that a medical inspection of every vessel arriving in port was the only really effectual means of carrying out preventive measures in ports. This was objected to on account of the difficulties that would be put in the way of shipping companies if it was insisted on, also on account of the cost to the port sanitary authority and because of the apparently few cases discovered by this means. He had recently worked out this point in the case of plague, and in eight years' experience the ratio of cases discovered was 1 in 90,000 inspected. Yet if this criterion was applied to preventive work of all kinds similar remarks might be made as to other diseases, and, in his opinion, the measure was well worth the trouble and expense involved. With regard to the bacteriological examination of excreta, he would like to ask what provision the regulations made to prevent delay in granting *pratique* to a vessel, for any delay was usually very irksome to a shipload of passengers and to the shipping companies? He agreed also that provision should be made for inspecting vessels under construction, with a view to the proper fulfilment of sanitary requirements.

Dr. GILBERT E. BROOKE (Singapore) said the sanitary administration of ports depended on many factors, such as situation of port, tropical or temperate; distance from infected ports, etc. But certain essentials might be insisted on—for example: (1) Measures to be taken at port of departure rather than port of arrival if possible; (2) uniformity of procedure (international) in order to facilitate commerce, especially standards of imposition and removal of quarantine; (3) uniform bills of health (international) to replace present nondescript documents; (4) Establishment of two British bureaus of information—one in London and one in Singapore—which might collect and disseminate prompt and reliable information of infectious disease in Western and Eastern hemispheres.

Dr. HEGGS (Sittingbourne) considered that officials of the Board of Trade, whose duties included inspection of ships, should have some sanitary experience. He thought that as many local authorities were losing their keenness about vaccination, there should be more surveillance of persons arriving from ports infected with small-pox. He did not think it wise for sanitary authorities to use their small-pox hospitals for tuberculosis cases, though an exception might be made in the case of port sanitary authorities.

The PRESIDENT said that port sanitation might be considered as the first line of defence against the importation of disease, and in his opinion the sanitation of British ports was altogether excellent and efficient. Small-pox had declined to a very large extent in recent years. British vessels traded to foreign parts and brought back cases of small-pox; but the disease did not spread, and why? Because of the preventive measures adopted at the ports. One debt which they owed to port sanitary authorities was the immunity enjoyed by the country from small-pox. The same thing applied to cholera and plague. These facts were not, perhaps, realized as they ought to be. Expenses should not be grudged, and in this connexion prosperity, health, and finance should go hand in hand. He quite agreed with Dr. Brooke that a better international bureau of information was required in foreign ports. He thought that the opening of the Panama Canal in the near future would bring foreign ports nearer to one another, and one result might be an interchange of yellow fever on the one hand and of plague on the other. The whole subject was one of supreme importance and interest.

Dr. WILLIAMS, in his reply, agreed with Major Jackson as to the difficulty of diagnosing yellow fever in some cases. It was a fact that the disease was not always "yellow," and on the West Coast of Africa it had only recently been diagnosed. As to inspection of vessels, they had no legal power to inspect every vessel, but in London and Liverpool, at any rate, all vessels arriving from foreign ports were visited, and the captain was required to notify cases of illness. As to bacteriological examination of excreta when there was suspicion of cholera, it would be sufficient to detain the passengers for twenty-four hours, during which time a bacteriologist could weed out the healthy from the suspects, and the latter could be kept on board until the investigation was completed. He quite agreed with remarks that had been made as to the ignorance of the ordinary ship surgeon of infectious diseases, especially of small-pox, and there was no doubt that many of the port inspectors were quite inefficient in the matter of examining ships. The usual "bills of health" were quite useless, and he would be glad to see something adopted on the lines suggested by Dr. Brooke, whose suggestions as to bureaus of information were also most important. At present they relied to a great extent on the United States Marine Service, which was of extreme value. With regard to tuberculosis, though the notification order did not apply to ports, he was in the habit of acting as though it did, and in any case of actual or suspected tuberculosis arriving in port the name and address of the person affected was taken and sent to the medical officer of health of the district in which he lived.

DESTRUCTION OF RATS IN THE PORT OF RANGOON.

By F. ARTHUR FOY, M.B., C.M., D.P.H.,
Port Health Officer of Rangoon.

THE destruction of rats is one of the most important preventive measures adopted against plague; their destruction on board has been brought into use only partially. It is used for the following three purposes:

1. *When a vessel is found plague infected.* A vessel may become plague infected:

(*a*) By the occurrence of a human plague case on board. This is very rarely reported by the commander to have occurred on the voyage. It may also comparatively rarely be detected at inspection of passengers and crew on board on arrival, even where this inspection is held as a routine practice. A case with fever may be reported or separated at inspection on arrival, but is then usually not sufficiently advanced to permit of immediate classification as a distinct case of plague, and the vessel has to be given *pratique*. Other cases may be discovered in a town and be reported to have originally come by a certain vessel named, but by the time the diagnosis of any of these cases is arrived at, the vessel has not only unloaded her cargo but has probably started loading again for the next port. The occurrence of the case of human plague on board does not necessarily prove that the rats were originally infected and spread the disease amongst the passengers, or that the case of human plague that occurred has left infected rat fleas on board which have since infected the rats. It is thus easily seen how the interruption to work that is caused by the insistence on destruction of rats because of the occurrence of a case of human plague is a matter of great vexation to shipowners though quite justifiable from a sanitary point of view.

(*b*) By the occurrence of cases of plague among the rats as indicated by rat mortality. This it would devolve on the commander to report. No such cases have been reported, and it is easy to see that unless very extensive, the report is unlikely to be made, as the finding of a single dead rat would probably never be reported to the commander, or, if reported, be treated by him in a very trivial manner. If every case that occurred were reported, or if extensive rat mortality occurred and were reported, destruction of rats would prove in such cases a most useful measure. The

routine trapping and bacteriological examination of rats on board of vessels would prove useful to ascertain if there were plague infection present among the rats, and, if present, to take necessary preventive measures.

2. *As a routine procedure.* Destruction of rats has also been employed as a routine procedure when vessels undergo annual repairs. This has been done to a very limited extent, only some small Government vessels availing themselves of it. The reason for this is that most of the vessels that ply to Rangoon are docked at their head quarters port, as at Calcutta, where in the case of some of them the rats are exterminated. This appears to be a most useful procedure, and one that cannot give the shipowners annoyance, since it can be carried out when the vessel is not urgently needed. Its insistence or adoption will certainly reduce the number of the rats on board among whom plague may spread, especially if care be taken not to let more rats on board from cargo boats and wharves.

3. It has also been employed as a routine matter when the vessel has finished discharging cargo, but prior to her commencing to load cargo again for certain special ports and countries which insist on the extermination of rats prior to the vessel loading cargo at an infected port for these countries and ports.

This is also a very beneficial procedure, but only done at the request of the shipping agents; and as it is not sprung on them suddenly, it is not seriously objected to by them. They know that it has to be done in order that the vessel may gain entry into the port that she is bound for, and prepare for it, and most of the vessels that have undergone it at Rangoon have gone through the procedure for this reason. Some of these vessels have previously undergone it only a short time (four to six months) before, but the process has to be repeated each time they proceed from an infected port to those ports that insist on it.

The process has been carried out in three ways: (1) By compressed sulphurous acid gas in cylinders; (2) by sulphur burnt in holds; (3) by the Clayton apparatus.

1. *By Compressed Sulphurous Acid Gas in Cylinders.*—This has been carried out by way of experiment. As the chief officers of some vessels whom I interviewed said, they could not be certain that they had rats in certain circumscribed areas, such as store-rooms on various vessels, I got permission for the purpose of these experiments to let loose a few rats into certain areas. Three experiments were carried out. The results are shown in Table I:

TABLE I.

No. of Experiment.	Cubic Capacity of Area.	No. of Rats let Loose.	No. of Cylinders used.	Time Closed.	No. of Rats Killed.
1	3,320 cub. ft.	7	2	6½ hrs.	3
2	4,085 cub. ft.	8	2	8 hrs.	0
3	4,085 cub. ft.	Same rats as above	3	8 hrs.	4

REMARKS.—*Experiment 1:* This experiment was interrupted. The hold was opened in between by the carpenter, who worked halfway down this hold. The hold was then reclosed, and when reopened and ventilated 2 rats were found alive at the level the carpenter worked, but 3 rats were found dead at the bottom of the hold; 2 had evidently escaped. *Experiment 2:* Not enough cylinders used. *Experiment 3:* The rest of the rats had probably escaped while the hatch was opened for ventilation after Experiment No. 2.

From this it is seen that if a few extra cylinders over and above the number recommended be used the results are likely to be successful. It is therefore a suitable method for use in small launches, and may prove useful in very small ports where the Clayton apparatus is not available.

2. *By Burning Sulphur.*—This was done in the holds of six small steamers because they were reported to have had cases of human plague on board, and in one store-room, merely to kill any rats there might be in it. In the latter instance 5 mice and half a bucketful of cockroaches were killed. In the former instances the holds were evidently free of rats, as none were killed, but in one of these instances some cockroaches were killed.

3. *By the Clayton Apparatus.*—This has been effected in forty vessels. Three of the vessels that underwent it were infected by human plague cases. Three vessels underwent it while their annual repairs were proceeding (these were three lightships), while the remaining thirty-four vessels underwent it in order to comply with the regulations in force in some foreign countries insisting on destruction of rats prior to loading cargo at infected ports.

Of these 34 vessels, 6 vessels underwent fumigation here for the second time while 4 were said to have been fumigated in other ports from four to six months previously; the remaining 24 vessels were understood to have been fumigated here for the first time.

Percentage of Gas in the Holds and other Areas Fumigated.

This is recorded in Table II, from which it is seen that out of 163 areas fumigated the percentage recorded is not available to me in 32 instances. Of the remaining 131

TABLE II.

1½	per cent. in		2	holds, etc.	3½	per cent. in		15	holds, etc.
1¾	,,	,,	2	,,	3¾	,,	,,	5	,,
2	,,	,,	10	,,	4	,,	,,	18	,,
2¼	,,	,,	4	,,	4¼	,,	,,	7	,,
2½	,,	,,	11	,,	5	,,	,,	3	,,
2¾	,,	,,	9	,,	5¼	,,	,,	1	,,
3	,,	,,	7	,,	6	,,	,,	1	,,
3¼	,,	,,	6	,,					

About 3 per cent. average in 131 holds, etc.

Not recorded in ...	... 32	,,
Total ...	... 163	

the percentage most often obtained was, roughly, 3 per cent., and this was in 37 instances. The lowest percentage recorded is 1½. The average percentage employed is nearly 3, and the highest 6, all these being rat-destroying percentages.

Percentage of Gas which Prevailed in the Areas in which Rats were Destroyed.

As the areas had no cargo in them the percentages obtained were quite sufficient for the destruction of rats. The lowest percentage resulting in rat destruction is recorded as 1¾, and only in 2 instances did this percentage prevail, and in both these instances rats were destroyed. Only in 2 other instances is a lower percentage, namely, of 1½, recorded. In 12 instances the percentage recorded is not available. In the remaining 41 instances in which rats were destroyed the percentages ranged from 2 to 5¼. One hold was fumigated with 6 per cent., but no rats were found after the operation. The largest number of rats found dead in one hold were killed with a percentage of 2½. The percentage which resulted in rat destruction in the largest number of instances was 3 per cent. in 14 instances. The average percentage used in the 43 instances recorded was 3. (See Table III.)

TABLE III.

With 1¾	per cent. of gas rats were destroyed in						2	holds, etc.	
With 2	,,	,,	,,	,,			2	,,	
With 2¼	,,	,,	,,	,,			2	,,	
With 2½	,,	,,	,,	,,			3	,,	
With 2¾	,,	,,	,,	,,			6	,,	
With 3	,,	,,	,,	,,			14	,,	
With 3¼	,,	,,	,,	,,			3	,,	
With 3½	,,	,,	,,	,,			2	,,	
With 3¾	,,	,,	,,	,,			1	,,	
With 4	,,	,,	,,	,,			6	,,	
With 5	,,	,,	,,	,,			1	,,	
With 5¼	,,	,,	,,	,,			1	,,	
An average percentage of 3 for ...							43	,,	
Rats destroyed but percentages not recorded in							12	,,	
Total							55	,,	

Presence of Plague Bacilli in Rats Destroyed by the Clayton Apparatus.

The rats destroyed in the above operations were examined in 22 instances from 19 steamers for the presence of plague bacilli, and only in one instance were plague bacilli found. As putrefactive processes may have destroyed the plague bacilli if present before the rats could be examined in the other instances, no general inference can be drawn from the above.

Cockroaches were killed in the operations sometimes in large numbers. That some were found alive on inspection next day was probably due to their flying in to the open holds during the night from the deck.

Data as Regards the Presence of Rats in Vessels.

From the number of rats recorded as destroyed, some inferences may be drawn on this subject. In 39 vessels operated on, rats or mice were found destroyed in some of the holds and other areas on 26 vessels, but no rats were found dead on the remaining 13 vessels. Of these 13 vessels, 3 underwent fumigation here six and four months previously, and in one of these three no rats were found on the first occasion but were on the second occasion. Of the remaining 10 vessels, 3 were said to have been fumigated elsewhere about three months before, leaving 7 fumigated for the first time here without any rats being found. Of the remaining 26 vessels on which rats were found, one was said to have been fumigated about three months before elsewhere.

On 6 vessels the rats found were under 5 in number; on 4 vessels from 5 to 10 in number, and one of these was the one fumigated for the second time here. On the remaining 16 the dead rats were fairly numerous in number, 61 being the largest number found on a sea-going vessel. But the largest number found on one vessel is recorded as 250, and this was a lightship, which came into port from outside for annual repairs. The details are recorded in Table IV:

TABLE IV.

Under 5	rats and mice in	...	...	6	vessels
From 6 to 10	,,	,,	...	4	,,
From 11 to 15	,,	,,	...	3	,,
From 16 to 20	,,	,,	...	1	,,
From 21 to 25	,,	,,	...	2	,,
From 26 to 30	,,	,,	...	1	,,
From 31 to 40	,,	,,	...	1	,,
From 41 to 50	,,	,,	...	2	,,
From 57 to 60	,,	,,	...	1	,,
From 61 to 70	,,	,,	...	2	,,
Over 70	,,	,,	...	3	,,
		Total	...	26	vessels.

Number of Holds in each Vessel in which Rats were Found.

This is recorded separately for twelve vessels, and the details are given in Table V. From this it is noticeable that on an average 56 per cent. of each of the vessels on which rats were found were infested with the rats in some number (which also corresponds with the average given above).

TABLE V.

In 1	out of 7	holds	in 1	vessel	=	14%	of the vessel
In 1	,, 5	,,	in 1	,,	=	20%	,, ,,
In 1	,, 4	,,	in 1	,,	=	25%	,, ,,
In 2	,, 5	,,	in 2	,,	=	40%	of each vessel
In 3	,, 5	,,	in 2	,,	=	60%	,, ,,
In 4	,, 6	,,	in 1	,,	=	66%	of the vessel
In 5	,, 7	,,	in 1	,,	=	71%	,, ,,
In 3	,, 4	,,	in 1	,,	=	75%	,, ,,
In 4	,, 4	,,	in 1	,,	=	100%	,, ,,
In 5	,, 5	,,	in 1	,,	=	100%	,, ,,

Average portion of each of above 12 vessels found infested with rats, 56%.

The total number of holds in which rats were found were 71 out of 169 fumigated; no rats were found in 95, and for 3 holds fumigated there is no record as to rats. In the 62 holds of the 12 vessels which were each fumigated singly rats were found in 34 holds. This comes to an average of 55 per cent. of each vessel.

Incidentally one occurrence is worthy of record. A man fell into a hold accidentally as the hold was being opened up after 2½ per cent. of gas had been used. The chief officer, who was a powerful man, went down a ladder after him and brought the man up. Fortunately both survived.

DISCUSSION.

Dr. HERBERT WILLIAMS quite agreed with Dr. Foy's remarks as to the use of compressed sulphur dioxide. He had made experiments some years ago and found SO_2 inefficient unless the whole of the gas could be diffused throughout the ship's hold to the amount of 3 per cent. CO_2 and CO were used in Hamburg. Dr. Harker, in Australia, had utilized the gases from the ship's funnels, which contained much CO. He claimed that these gases were useful not only for killing rats but for extinguishing fires. On account of its poisonous nature and absence of odour CO should be used with great caution. No gas was really effectual unless it killed fleas as well as rats.

Dr. HOPE said that in Liverpool an attempt had been made to ascertain the relative merits of each method of killing rats, and as far as the investigations went the upshot appeared to be that there was no very great difference provided the methods were efficiently applied. As an illustration of the great importance of this subject he mentioned that there had recently been instituted a French society for "deratization."

DISCUSSION ON THE PREVENTION OF TUBERCULOSIS.

OPENING PAPERS.

I.—E. W. HOPE, M.D., D.Sc.,

Medical Officer of Health for the City and Port of Liverpool; Professor of Public Health, University of Liverpool; President of the Society of Medical Officers of Health.

WITHIN the great subject of the prevention of tuberculosis, which so largely occupies public attention to-day, almost all measures of practical sanitation are comprised. What I wish specifically to refer to now are those exceedingly important and interesting aspects where prevention and treatment may be said to join hands. The cure of a case of open tuberculosis is a preventive measure in the same sense that the term may be applied to small-pox or to typhoid fever. It implies that there is one less focus of infection. Similarly, during the period of treatment of the infective case of tuberculosis in a properly constituted sanatorium all risk of infection is removed; while there is danger in the retention of the patient in his home there is little or no danger when the patient is under appropriate conditions. I think I may say that the real position of the sanatorium at the present time, and the incalculable advantages associated with it, alike to the patient and the public, are becoming understood. A few years ago there was a real risk of a set-back to the provision of sanatorium beds by sanitary authorities owing to the extravagant predictions which have been put forward by enthusiasts to the effect that the sanatorium treatment necessarily meant cure, predictions which raised public expectation to a high pitch, resulting in a disappointment commensurately great. As a preventive instrument the sanatorium must occupy a position of as great usefulness in regard to tuberculosis as the hospitals for ordinary infectious sickness have in the past proved themselves to have done. There has also, I fear, been a tendency to obscure the preventive measures by other rival and extravagant claims of cure, all of which appear to have excited great temporary enthusiasm, to be followed by the disappointment—not to say despair—of the sick and their friends.

Another exceedingly useful administrative accessory, designated under various titles, such as tuberculosis dispensary, or out-patient department, or tuberculosis institute, having for its object the facilitating of early diagnosis, the ensuring completeness of records preliminary to preventive operations, and ensuring or undertaking special treatment, has also been in some danger of losing a great deal of its useful public influence by the enthusiastic advocates who proclaimed that forms of treatment of a specific kind, carried on in connexion with it, must certainly result in recovery. False expectations once again; illusory hopes of cure diverting attention from real protective measures.

There are striking parallels in the circumstances which have accompanied the decline of phthisis and in those associated with the decline and disappearance from various parts of the world of other afflictions of the human race. No one would seriously question that preventive measures, rather than treatment, however excellent and skilful it may have been, have freed whole regions from plague, from typhus fever, from malaria, small-pox, cholera, and enteric fever; and so, one cannot help thinking, is and will be the case in regard to tuberculosis. I know that some have gone so far as to suggest

that these declines are due not to sanitation, but to immunity resulting from universal inoculations with the disease, but this is a view to which well-known facts lend no support.

With reference to the rival methods of treatment, it may be, perhaps, a fact that the well-known credulity of the public and the natural hopefulness of the sick have given to the publicly expressed views of the physician a meaning altogether foreign to that which he intended to convey. For example, the history of tuberculin treatment would point to this from its earlier inception to one of its later manifestations—I mean the Friedmann "cure"—which awakened great public interest; and now, alas! according to the BRITISH MEDICAL JOURNAL of a month ago, the Board of Health of New York have adopted a resolution the immediate effect of which was the closing of the Friedmann Institute in that city. It must not be thought that the advocates of prevention are not alive to the necessity of doing everything which human ingenuity and skill can do for the treatment and relief of those who are already suffering, and there is not the slightest likelihood that that branch of the subject will at any time suffer, however strenuously sanitary authorities may devote themselves to prevention.

Undoubtedly the sanatorium benefit clauses of the National Insurance Act and the provisions of the Finance Act of the same year are giving an immense stimulus to measures preventive and curative, as well as to research, all of which must hasten in greater or lesser degree the extinction of tuberculosis.

II.—H. O. WEST, M.D.,
Tuberculosis Officer, County of Kent.

THE FUNCTIONS OF THE TUBERCULOSIS OFFICER.

IT is as yet, perhaps, a little early to attempt to describe fully the functions of a tuberculosis officer. The office of tuberculosis officer is of so recent creation, and the experience gained is so generally limited, that any consideration of his functions must at present be largely theoretical. My particular duty on the present occasion is to assist in opening a discussion on this part of the general question of the prevention of tuberculosis, and the following statement represents not a complete survey, but my own personal conceptions as to the position and functions of a tuberculosis officer.

The general idea of the work of a tuberculosis officer has been outlined, but perhaps a little vaguely, in the reports of the creators of his office—the Tuberculosis Departmental Committee. In a sentence, he is to be a clinical expert, in intimate relationship with all the public health and allied authorities. Although it is not possible, I think, for the reason already given, to delimit his duties exactly, it seems to me that the most profitable way of approaching this subject will be to consider it from these three points of view, namely:

(1) The tuberculosis officer in his relationship to the public health authorities—*central* (the county and county borough councils) and *local* (the local sanitary authorities).
(2) The tuberculosis officer in his relationship to other medical men, particularly to those in general practice.
(3) The tuberculosis officer in his relationship to patients and to the lay public generally.

1. *The Tuberculosis Officer in his Relationship to the Public Health Authorities.*

It will be remembered that, acting upon the report of the Tuberculosis Committee, the Government have constituted the county and county borough councils the administrative units as regards the prevention and treatment of tuberculosis. The tuberculosis officer is therefore primarily an officer of that central public health authority. The responsible official of such a body for the public health and allied preventive measures is its medical officer, so that, in my opinion, it is clear that the tuberculosis officer must be on the staff of the medical officer of health. The view, apart from other considerations, that he should come into the province of the county or county borough medical officer and be independent of him has always seemed to me not only impracticable, but unwise. It has, I think, to all intents and purposes disappeared, as might have been expected, and has been succeeded by the view I have formulated.

It seems to me that the position of a tuberculosis officer in relation to the central public health authority may be summed up as follows: That he is a clinical expert on the staff of the medical officer of health, responsible to him, and to him alone, as his chief, and working entirely under his direction.

In a county borough, so far as I can see, no more need be said under this heading; but in a county area there are the various local sanitary authorities (of which it is composed), with their respective medical officers of health, to be considered.

What is to be the relationship in such areas of the county tuberculosis officer to the local medical officers of health? This is a question around which there has been some controversy. In my opinion, the problem will be best solved by the complete separation of the clinical work from the complementary questions of housing and general sanitation. Inspection of houses and investigation of sanitary conditions ought not, it seems to me, to be considered to be part of the tuberculosis officer's duties; neither, in my opinion, ought medical officers of health, as a rule, to be expected to be anything like clinical experts in medicine.

I would prefer to regard the position of a tuberculosis officer largely as that of a consulting physician, and I do not think there would be any possible controversy if the position were maintained that he is a clinician pure and simple, dealing only with the clinical treatment of patients, and leaving always, as a matter of course, the whole sanitary question to the local medical officer of health. There is a difficulty which may arise under such an arrangement. It tends to lead to a multiplication of visits from various public officials, and this may raise objections on the part of the patient or his friends—a result which it is of course important to avoid.

An alternative plan is that the tuberculosis officer should undertake the duties of the medical officer of health, and for this particular purpose act as an officer of the local sanitary authority under the direction of the medical officer of health.

Such a plan has been suggested as a possibility in a recent Local Government Board order. It seems to me that such an arrangement is impracticable, for the reason that an officer of the central authority can hardly at the same time be an officer of several local authorities.

Co-ordination there must be, of course; but the one co-ordinating public health officer is the county medical officer, and the tuberculosis officer can only come into the sphere of, and into relationship to, the local medical officers of health as one of the county officer's staff. On any other basis than this I think difficulties will occur. One difficulty, I think, in particular suggests itself. I can imagine a district medical officer of health saying "Tuberculosis is a public health question. It is a notifiable disease, and therefore one for which I am responsible. Why should the tuberculosis officer come into my area at all and carry out work which I can do?" In other words, "Why should I not be the local tuberculosis officer?"

At first sight, at any rate, such a position is a plausible one to take up. There are those who consider that the local sanitary authorities should be the administrative unit, that the medical officer of health *should* be the tuberculosis officer of the particular dispensary or dispensaries in his area, and many local authorities have already undertaken work of this character on the advice of their medical officers. It is unnecessary for me to attempt to discuss this particular question, for were I to do so I should be involved in a consideration of the relationships between local and central authorities, and with such a question I am not competent to deal. I would but remind you in passing that no such suggestion was made by the Tuberculosis Committee. But in any case I maintain that there need be no suspicion of a tuberculosis officer usurping the functions of the medical officer of health. Rather than this should appear so, I suggest that the possession of a diploma in public health should not be regarded (as now so commonly the case) as any special qualification for the appointment. It is, of course, true that such a diploma confers (among many other things) a certificate of proficiency in bacteriology,

but, with the general establishment of such laboratories, I hardly think that particular asset of much importance, and would prefer to see greater emphasis laid on clinical experience. For instance, I think that the fact that a candidate was a member of the Royal College of Physicians should carry much more weight. I can speak without prejudice, as I do not hold a diploma in public health, nor am I a member of the Royal College of Physicians.

I think I have now indicated sufficiently my personal views, namely, that the separation of the clinical duties is the solution of the problem, but whatever is ultimately decided I venture to protest against the idea that it is necessary to conceive either the tuberculosis officer or district medical officer of health as being in a superior or inferior position, but rather as collateral. I should prefer to regard their functions as (to borrow a theological phrase) remotely the same, but proximately entirely different.

2. *The Tuberculosis Officer in his Relationship to other Medical Men.*

The modern scheme, which, wisely or unwisely, centres round the tuberculosis dispensary, brings the tuberculosis officer into relationship with the general practitioner, and again it is necessary to delimit the respective functions. I suppose when the idea of a tuberculosis officer was first mooted he had no greater opponent than the general practitioner. That feeling is disappearing, in some places very rapidly. The view that a band of irresponsible young men who from the nature of things could not have had as much experience of chronic tuberculosis as the average general practitioner, would come into the doctor's private practice and remove all his cases of tuberculosis—clinically and financially—has been shown to be entirely baseless. In fact the functions of the tuberculosis officer as relating to the general practitioner have now, I think, been sufficiently clearly defined as to disarm criticism.

I am not conversant with the arrangements made in many areas, but I think I am right in saying that such conditions obtain in Kent, at any rate, where the plan is as follows:

1. With regard to insured persons, the tuberculosis officer meets the doctor in charge of the case. Unless institutional treatment is agreed upon, the fullest possible use is made of domiciliary treatment, which is then left entirely in the hands of the general medical practitioner.
2. With regard to uninsured persons who are for the time being treated only in dispensaries. In Kent the understanding is that no patient is accepted for treatment unless authorization is received from a medical man, usually the practitioner in charge of the case.

Later on it is hoped that the tuberculosis officer will have general practitioners as assistants in the dispensaries. These two provisions will be a sufficient guarantee against the dispensaries being used by persons for whom they are not intended. For the rest, the tuberculosis officer does not inflict his attention on the unwilling doctor, but is ready to be of any use he can, either in or out of the dispensaries, to such as wish his assistance.

There is another group of medical men to be mentioned—the medical staff of the voluntary hospitals. There are cases of tuberculosis which are very suitable for treatment in general hospitals. I for one hope that the day is not far off when some working arrangements may be made for such cases to be admitted to the voluntary hospitals. If this were done, why should not the tuberculosis officer—granted that he had suitable credentials—be elected on the staff of the hospital for those particular beds?

3. *The Tuberculosis Officer in his Relationship to Patients and the Lay Public Generally.*

I think that as regards patients the tuberculosis officer should be recognized as a consultant. His visits and treatment should be regarded as matters of some favour, and it ought not, I think, to be looked upon as a hardship if the patient has to wait some little while for the tuberculosis officer's visit. I have already expressed the opinion that the tuberculosis officer is a clinician; while that is true, tuberculosis more than other diseases is one which needs other than mere clinical help. The tuberculosis officer may have to be ready to give his advice as regards domestic and financial matters—in fact, to some extent, to be an almoner.

Finally, the tuberculosis officer has, like all public officials, a duty to himself. It is his function to maintain a high standard of efficiency by whatever means possible. We know little enough about tuberculosis at present. More we hope for in the future. The tuberculosis officer's education, therefore, should not be regarded as finally completed. He should, I think, have the opportunity of keeping in touch with modern research and modern methods. In this connexion the suggestion of the Tuberculosis Committee that every two or three years the tuberculosis officer should have a period off duty for going back to hospital is one full of value, and, if it can be rendered practicable, should be welcomed in every possible way.

DISCUSSION.

Dr. A. D. Serrell Cooke (London) said: Nature's method of cure in tuberculosis is by means of tuberculin inoculated from the seat of disease, and 20 per cent. of cases of pulmonary tuberculosis spontaneously cure themselves. Repeated hyperaemia and the production of antibodies locally produces cicatrization and healing. Hence the method of autoinoculation by graduated exercises, which has in certain cases produced some successful results. The disadvantage of this lies in the difficulty of gauging the amount of tuberculin injected at each dose and the inability to state when immunity has been reached. The advantage of using tuberculin by injection, if properly applied, is that we can estimate accurately the amount of tuberculin administered, and by gradually increasing dosage can attain a dose of 1 c.cm. Old Tuberculin in from six to nine months. The reason for the comparative failure of others using tuberculin is that minute doses, with minute increases, are administered over a long period of time, a dose of 0.1 c.cm. or 0.2 c.cm. bacillary emulsion being administered at the end of two years, or Béraneck's tuberculin used over a period of two years. Antibodies probably are not produced in sufficient amount owing to the insufficient stimulus given by these small doses. It has been said that tuberculin only confers an immunity to tuberculin, but not to tuberculosis. A well known authority has stated that he used tuberculin successfully in minute doses with minute increases in a case of psoas abscess, but that the patient ultimately died of some other tuberculous disease; although it was found at the autopsy that the psoas abscess was cured. The reason for this is that tuberculous processes are going on during the time small doses are given, but that tuberculin only begins to act when it is increased as rapidly as possible and large doses have been reached. As an example, a case of pulmonary tuberculosis with laryngeal tuberculosis was treated. On the smaller doses the pulmonary condition appeared to get better and the laryngeal condition much worse. When large doses of tuberculin were reached the laryngeal condition began to improve. Dr. Camac Wilkinson's method is to increase the doses as rapidly as possible, by as much as the patient can tolerate it, not only increasing the dose by a definite ratio, but increasing the increase. A mild reaction is aimed at, excessive reactions being avoided, and it is to be noted that no two individuals can be treated alike, or by set rule. At the tuberculin dispensary we are able to treat 75 per cent. of all cases of tuberculosis, with about 70 per cent. successful results, while the patients for the most part remain at work. The tuberculins used at the dispensary are prepared from both bovine and human types of bacilli, and in cases caused by the human type of bacillus those usually employed are P.T.O., P.T., and Old T. Other preparations sometimes used are T.E., which is a glycerine extract of the pulverized human tubercle bacilli without filtration, which contains 5 mg. of dead bacilli in each c.cm., also T.A.F. and T.R. The diagnostic test for tuberculosis is employed in those cases where tubercle bacilli have not been demonstrated. The series of doses used are 0.001 c.cm., 0.005 c.cm., and 0.01 c.cm., of Old Tuberculin, which are taken as the standard. In cases of tuberculosis, we obtain a reaction which is usually local and general, and sometimes focal. Local reaction occurs at the site of inoculation usually in from twenty-four to forty-eight hours, and general reaction occurs

by a sharp rise of temperature up to or over 100° F., which after a short period falls again to normal. The focal reaction, when it does occur, occurs at the site of disease—thus in the lung where no crepitations were previously heard they are heard for the first time after the injection. Types of cases treated at the tuberculin dispensary are: Pulmonary, pleurisy, glands, sinuses, bones and joints, skin, and other surgical cases. From the point view of prevention, Dr. Latham has stated that tuberculin acts as a specific on cases of tuberculous pleurisy and peritonitis, and that 20 per cent. of all cases of pulmonary tuberculosis are the direct outcome of the pleurisy; further, that if all cases of pleurisy were treated with tuberculin 20 per cent. of pulmonary tuberculosis would be prevented. After treatment at the tuberculin dispensary is concluded, patients report themselves periodically, every three or six months. If they do not maintain their health, which is gauged by absence of cough and sputum and tubercle bacilli, and do not maintain their weight and energy, they are retested and, if necessary, retreated. Retesting doses are 0.005 c.cm., 0.01 c.cm., 0.05 c.cm., 0.1 c.cm. of Old Tuberculin. Treatment in these cases is usually by means of Old Tuberculin and bacillary emulsion, until, as a rule, a dose of 2 c.cm. or 4 c.cm. bacillary emulsion is reached, when we find that the patient's health is much improved. It is not claimed that the successes attained are cures, as sufficient time has not yet elapsed since treatment ceased, but from experience of others elsewhere the greater proportion of them will probably prove to be so.

Dr. DUNCAN FORBES (Brighton) considered that, so far as county boroughs were concerned, the medical officer of health should be the chief administrative officer, that the tuberculosis officer should act as a consultant, and also that he should act as assistant to the medical officer of health in all preventive work. The work of prevention and treatment were not separated, either in the sanatorium, where education was recognized as equal in importance to treatment, or in domiciliary treatment, in which the doctor was expected to teach the patient how to prevent his reinfection. He felt certain that in every instance if it was possible the clinician should also act as an administrator. In giving statistics as to tuberculin treatment, the cases which showed tubercle bacilli in their sputum should be separated from those which had not shown tubercle bacilli. Tuberculin would have to establish its reputation on its results in the treatment of cases showing tubercle bacilli in the sputum if the profession was to place faith in it. The patient's history should also be followed for a number of years.

Dr. JOHN MACKEITH (London) stated that he had listened to the papers read with much interest. He was of the opinion that it was very essential to keep the duties of the tuberculosis officer and the medical officer of health distinct, the former being chiefly limited to those of the clinical expert, and those of the latter to preventive measures. The relationship of the tuberculosis officer and the medical officer of health was at present in a transition stage, but would no doubt come to be clearly defined in the near future. In answer to Dr. Duncan Forbes's statement that the success of treatment by tuberculin in cases where tubercle bacilli were found in the sputum should be confirmed by their disappearance from the sputum, he gave particulars of several cases in his experience in which this had taken place. He had under his care several patients who were suffering from atrophic rhinitis, but who also had coughs, and on having their sputum examined, tubercle bacilli were found. He advanced the opinion that very probably atrophic rhinitis was a tuberculous affection, and he looked for good results in the treatment of this disease by tuberculin.

Dr. R. MURRAY LESLIE (London) agreed with Dr. West in his main contention that the work of the tuberculosis officer should be principally that of a clinical expert, and that the administrative and preventive work should be entrusted to the medical officer of health. There was no question of superiority or inferiority. The tuberculosis officer was not a junior medical officer but an expert clinician, who by his special training and experience was qualified to diagnose pulmonary tuberculosis in its earliest stages. With regard to the question raised by Dr. Forbes that from a statistic and therapeutic point of view it was advisable to separate the patients into two classes, according to whether tubercle bacilli were or were not present in the sputum, his experience as physician to a London consumption hospital led him to state his opinion emphatically that if treatment was not commenced until tubercle bacilli appeared in the sputum one had waited too long. Modern instantaneous radiography now enabled the physician to diagnose pulmonary tuberculosis (particularly the *hilus* or root variety) before tubercle bacilli appeared in the sputum, and long before physical signs manifested themselves. Diagnostic tuberculin reactions, observations of the opsonic index before and after exercise, and definite *x*-ray appearances were quite sufficient, apart from tubercle bacilli, to diagnose tuberculosis with sufficient accuracy to warrant careful treatment, and even, in his opinion, notification also. A careful distinction should be drawn between open or infectious cases on the one hand, and closed or non-infectious cases on the other. It was the latter class of case that could be treated with safety in the patient's own home by hygienic and specific therapeutics, with the strong probability of permanent cure.

Dr. T. B. HEGGS (Sittingbourne) said he was sure all present were most pleased to hear of such successful methods of the administration of tuberculin. Many of them were at work with this method of treatment, and their results were moderate when compared with the statistics given that morning by Dr. Cooke. He thought it most desirable that such statistics should only be published after careful inquiry, in view of the moderate results of other observers, as great harm would be done by the impression being conveyed to general practitioners that similar results might be obtained by them. He would like to have a definite statement from Dr. Cooke as to what he considered was the criterion of cure in his cases. As to the position of tuberculosis officers, the main question appeared to him to be what type of officer it was the intention of the Departmental Committee to establish. He believed the intention was to obtain for the general practitioner an expert clinician whom he could consult with in difficult cases. In actual practice the duties of tuberculosis officer consisted of recording work—clinical and statistical work. They were at present used as referees for insurance committees to guarantee that insured cases notified by practitioners as tuberculous were actually suffering from that disease. In most of those cases that was not expert work, and no difficulty in diagnosis was presented. He considered that the work of a tuberculosis officer should be confined to expert clinical consultations in difficult cases upon the request of a practitioner. His prestige should be maintained, his salary good, and his qualifications excellent. The mere administrative work of recording and statistics should be carried out by junior administrative officers of the public health service.

In answer to Dr. Heggs's question as to the criterion of cure, Dr. COOKE stated that they did not use the word "cure," but spoke of "successful results." By success they meant that the patient's energy had been restored, his vigour regained, and that he could work a whole day without being tired, and that his cough was either diminished or had entirely disappeared, and that he was either bringing up no sputum at all or very little, and when the sputum was examined it was found that the tubercle bacilli had diminished. In many cases where there had been much destruction of lung tissue the patient became a "carrier," and patients in whom large cavities existed would always expectorate tubercle bacilli. As he had stated, they gave large doses in retesting cases, and if a patient did not react to these enormous doses, they regarded that as a successful case.

Dr. A. GRIFFITH (Hove) said that the problem of prevention remained the duty of the medical officer of health, as it always had been. He must do his duty and not imagine that the present methods were going to do very much. Sending patients to a sanatorium was like sending them to paradise for a while and then letting them go back to purgatory. In his opinion, two of the most important causes of tuberculosis were inefficient feeding

and dampness of houses. These could be remedied by the medical officer of health. As to the position of the tuberculosis officer, he doubted if these experts were wanted at all. All over the country there were hospitals where patients or specimens could be sent for examination, and they had eminent experts in the London hospitals who gave free advice. Certainly they did not want the young expert. He believed that the proper function of a tuberculosis officer was to be a co-ordinating official, to carry out treatment on connected lines and differentiate the patients who required sanatorium and those requiring domiciliary treatment. He was much interested in the confession of Dr. Cooke as to his criterion of success, which was an excellent result of the discussion. He believed that Dr. Wilkinson did very good work, but he thought it a pity that he should claim more successes than he was entitled to. By adopting Dr. Cooke's criterion of success the number of cured cases would be multiplied. The idea of carriers of pulmonary tuberculosis was new to him.

Dr. W. A. BOND (London) said that there had been a very large increase of urbanization in the last sixty years, and notwithstanding that factor and the increased facilities for infection, there had been a large reduction in the death-rate from tuberculosis; 95 per cent. of all children between the ages of 12 and 13 were infected with tuberculosis, which they knew to be an omnipresent disease. He believed that one chief cause of the diminished death-rate was increased resistance. Almost all children had practically become infected with tuberculosis and were more or less protected for a number of years. This protection resembled that from small-pox conferred by vaccination or inoculation. He believed that good results could be obtained from the use of tuberculin in properly selected cases.

Dr. WILLIAM EWART (London), regarding pulmonary disease as responsible for the wide dissemination of tuberculosis, looked for more direct measures for its prevention and earliest treatment than hitherto proposed. Neither tuberculin nor the sanatorium offered at present any opportunity for the neglected study of the pulmonary factor—namely, of the special apex liability of some subjects and of the best way to counteract it. For prevention it might now be possible, through efficient school inspection, aided by compulsory notification, to sift the entire growing population into two groups—those free from all special liability, whether circumstantial or personal, and those structurally predisposed to apex disease—and to protect the latter by efficient methods of apex culture. For earliest treatment similar measures might fulfil the indication, on the lines of the "graduated labour" method, now approved for the healing stage, but probably not applicable without suitable modifications to the intermediate stages. The direct local treatment conveyed by artificial pneumothorax pointed to an unfulfilled requirement. For all early stages the clear indication was to combat the disease at its site, and with that view the possibilities of a form of apex treatment were now under consideration.

Dr. MCWALTER (Dublin) stated that in his opinion sanatorium treatment was an absolute failure as a specific method for the treatment of tuberculosis. He thought the profession was obsessed with the superstition that tuberculosis was due to the tubercle bacillus, and that every disease was caused by some definite organism. He would not deny that tubercle bacilli were found in almost every case of tuberculosis, but in his view tuberculosis was a mixed infection, and the presence of the tubercle bacillus alone was not enough to bring on the disease unless the surrounding conditions were favourable. Numbers of cases had been cured by simple remedies, such as garlic, lime, creosote, etc., before tuberculin was introduced.

RESOLUTION.

The meeting concluded with the passing, by a large majority, of the following resolution (proposed by Dr. HEGGS of Sittingbourne):

That this Section of State Medicine recommends to the Council of the British Medical Association that representation should be made to the Government that in cases of tuberculosis receiving sanatorium benefit the sickness benefit provided should not lapse at the end of six months, but should continue so long as the patient is, in the opinion of the medical adviser to the Insurance Committee, unfit for work.

DISCUSSION ON THE NECESSITY OF EDUCATING THE PUBLIC IN MATTERS RELATING TO PUBLIC HEALTH.

OPENING PAPERS.

I.—E. W. HOPE, M.D., D.Sc.Edin.,
Medical Officer of Health for the City and Port of Liverpool.

DR. HOPE said that it was a matter of intimate knowledge to every expert that during the last generation enormous improvements had been effected in the public health. A reference to the Registrar-General's reports showed that thirty to thirty-five years ago the rate of mortality for the whole country stood at a certain figure. Year by year that figure had steadily declined, and a very simple calculation enabled them to arrive at the conclusion that there were upwards of a million and a half of people now alive in the British Isles who would have been in their graves to-day if the rate of mortality had not undergone the decline referred to. That represented an enormous saving of life which very few people outside expert circles were aware of, and it meant also a prolongation of years of useful life, a diminution of suffering, and a saving of enormous expense. A reflex of it was to be found in the reports of almost every insurance company. It was found that not more than 75 per cent. of expected deaths actually did occur, and that the insurance companies were paying less by 25 per cent. than they expected to pay on the policies of the insured. Coming to a closer view, they could see in what direction this saving of life had occurred. Tuberculosis, typhoid fever, and other zymotic diseases showed a remarkable shrinkage in their incidence, and infant mortality had greatly declined.

The next thing to ask was, What had led to this reduction? No one supposed that it had been a gift from the gods to reward them for their deserts. These results had not been brought about without enormous expenditure and enormous difficulties which had to be overcome. It might be asked why there should not have been more unanimity as to the necessity of housing reform, wider streets, baths, wash-houses, etc. The reason had been the want of a proper educative public opinion. Every sanitarian must feel that his duties would be lessened in proportion as he could enlist popular sympathy with him. If one looked at the records of any great sanitary achievements of almost any period in modern history one found evidence of the hostility of municipal bodies in such matters as improved water supply, etc. All this would disappear with the extension of popular knowledge as to the importance of the work proposed. Let them glance for a moment at higher education in hygiene, and take the attitude of the universities. They could hardly conceive that the older universities were unfamiliar with the results of Greek culture, or with the sanitation of the Mosaic periods, and yet their seats of learning had never opened their mouths on the subject. He deplored this apathy, and gave credit to the University of Edinburgh, where preventive medicine was first established as a science, and degrees were given in the subject. Dublin and Cambridge a few years later took up the matter, and the new universities of Manchester and Liverpool put it in the forefront of their curriculum. At the present day there was no university in this country, he believed—certainly none in Germany—which had not its chair of public health or its professor of hygiene.

It was necessary to endeavour to cultivate a healthier public opinion. A method with this object in view, very popular in Germany and greatly extending in this country, was the holding of exhibitions. The exhibition held in Dresden, illustrating such things as quarantine and the hygiene of every industry and trade, had attracted millions of people during the six months it was open. An exhibition of a similar character held in

Liverpool attracted 40,000 people in one week. The public must be interested; so long as sanitation was a closed book people would take no heed of it. The proofs of the advantages of sanitary work were so great and so simple that if once a means could be found of revealing its facts to the public it would arouse an immense amount of interest, and prove an enormous stimulus to future progress.

II.—H. R. KENWOOD, M.B., F.R.S.Edin., D.P.H.,
Chadwick Professor of Hygiene, University of London.

I TAKE it that this discussion is intended to deal more particularly with the means whereby popular education in matters affecting public health may be brought about, rather than with the need which exists for such education; for on the latter point we are all of one opinion. It seems to me that, briefly put, our case is this: While it is impossible to compute the death-rate due to ignorance and apathy, we know that it is a considerable one; that it alone may be responsible for marked variations in local rates among persons similarly housed and earning similar wages; and that, when high, it is accompanied by much non-fatal sickness with a plentiful result of physical incapacity. Now there is only one remedy for ignorance—that of education. Short of this we can reach a certain sanitary standard, mainly of external appearances, but the richer results of sanitary practice are often not realized. It is because we have grown to appreciate the fact that, while both are necessary, sanitary practice is a greater factor of public health than sanitary environment, that the work of sanitary authorities is destined to become more and more educational. By bringing before the citizen such facts as are necessary to make him sympathize with and assist in the efforts of Parliament, sanitary authorities, and other agencies, to reduce preventable disease and raise the standard of physical fitness, sanitary authorities are enabling health legislation to achieve its best possible results; for, after all, the passage of a Public Health Act is only a means to an end. The legal remedy has often proved to be only a quack one, and not *the* remedy.

To go to the root of the matter, there is but one remedy—education; and, while the larger activities of public bodies can assist, the betterment desired can generally only come through knowledge which the individual himself will apply to his own intimate circumstances. For sanitary and education authorities to do more to remove the ignorance which so discounts their success is the wisdom that is surely coming; for, like sanitary authorities, education authorities have not yet fully realized their interests and duties in this respect. They cannot obtain the best results from their efforts to fit the greatest possible number of children to fill all the demands of good citizenship until our system of education provides some hygienic training, and some information is given to all the elder girls upon the subject of domestic hygiene (including infant care), even though this be at the expense of such a subject as geography. The aim of hygienic teaching and training is the formation of hygienic habits (of action and of thought); but instead of dealing with the prospective mother while at school, when hygienic habits are comparatively easily acquired, we are at present reduced to the necessity of facing the far greater difficulty of educating the actual mother. But those responsible for the details of our elementary education are slowly progressing towards the goal when the essentials of personal and domestic hygiene will be suitably impressed (by suitably trained teachers) upon all children in all elementary schools, the scope of this teaching and training being determined by a due regard to the circumstances of the scholars.

Having previously made important sanitary provisions for the collective needs of the community—such as a pure water supply, good drainage and sewerage, pure food, provision for stamping out infectious disease, etc.—and having also reaped the benefit of the indirect education which these bestow, the most effective branch of public health work in which sanitary authorities are now engaged is that concerned with the reduction of infant mortality, and this is so for the reason that it is mainly educational work, of a direct and personal nature, among the ignorant and the careless. The appointment of health visitors, who keep in touch with many of the poorer people, is an important step in the direction of meeting the great public health need for health missionary work. To indicate the thousand and one matters which nowadays ought to be common knowledge among the people would be to particularize at great length; but allow me to illustrate this need by a brief reference to two great problems which sanitary authorities are attempting to solve—the problems of a pure milk supply and hygienic housing.

We are hearing a great deal at the present time of the subject of clean milk. Every one who has an intimate knowledge of all the facts shares the view that an essential factor in the solution of the milk problem is the education (*a*) of the general public and (*b*) of the trade, in order to secure the practice of the many details to be observed in the hygienic collection, distribution, and storage of milk. By greater supervision of the industry and by securing the infliction of penalties for any neglect to guard adequately the health interests of consumers, sanitary authorities can promote this education of the trade; but legislators cannot hope to succeed in their effort to secure a clean and safe milk supply if they fail to ensure a considerable amount of supervision by a class of inspectors who, having a practical knowledge of the hygiene of dairy farming, can also act as educators. The key of the situation is, however, in the hands of the general public, who by their failure to demand clean milk and by allowing milk to get so much contaminated in the home, are mainly responsible for the evil consequences of dirty milk. There is no sentiment in commercial matters; public demand and competition govern everything, and if once a demand for clean milk becomes fairly general, it will be met by the trade.

Again, will any one of experience contend for a moment that the evil effects of bad housing are not mainly under the control of the tenants themselves? The most effectual cure even for bad landlords is better tenants. Insanitary environment is mainly the product of the man, and individuals without hygienic habits are but little benefited by sanitarily constructed premises; there is an improvement in external appearances, but internally the dwelling may be a slum. "Housing reform" can scarcely be justified in many cases unless greater efforts are made to reform the occupants.

Sanitary authorities, therefore, must avail themselves to the utmost of the educational means at their disposal, and the council offices should be regarded as the local bureau of all information and guidance on matters affecting public health. Apart from printed information distributed from the council offices, the local press (which has done such great service in recent years in disseminating the seeds of hygienic precept) might be furnished with suitable paragraphs month by month, and larger sanitary authorities might widely distribute "health bulletins," which, in addition to the dry bones of the vital statistics for the month, should furnish useful information on matters of hygiene and public health. Perhaps the most singularly successful publication of this kind is the bulletin issued by the Chicago Department of Health. This is a small leaflet, published weekly, the regular perusal of which would afford a good education in hygiene.

I must not conclude without a reference to "National Health Week," which grew out of a suggestion made some years ago that the clergy should be invited to devote their sermons upon one Sunday in the year to an appeal for hygienic practice, on the ground that while it promotes physical well-being it is also of high ethical value. This National Health Week movement has started well; and, since it is educational in its object, it deserves our cordial and active support.

DISCUSSION.

Dr. T. A. WILLIAMS (Washington, U.S.A.), gave an account of methods adopted by the Committee on Public Instruction of the Medical Society of the District of Columbia, of which he was chairman. The main principle which animated them was the desire to show the laity the meaning of medical science, in order to protect them from quacks and from the evils of quackery. The methods they adopted were as follows: (1) Public lectures. These had not been a success in Washington, though very successful in New York and Boston. (2) Special con-

ferences, such as the International Congress on Tuberculosis at Washington. These had been of great value. (3) Special articles in public newspapers written by experts but not signed. Those he believed to be the most efficacious of all methods, far superior to "health bulletins" issued by medical societies, as they were so widely read by the public. (4) The premium method, as used in Germany and France. An instance was given of the enthusiasm aroused in the town of San Antonio, in Texas, during an epidemic of yellow fever, when premiums were given for the best papers on the means of dealing with yellow fever. They had encountered many difficulties in prosecuting their campaign, the chief of which had been: (1) Public indifference. This they hoped would diminish in time, and the remedy was to go on hammering away. (2) Medical apathy and conservatism, which disliked new procedure merely from inertia. This was chiefly found among the older school of medical men. (3) Medical vested interests. Many medical men believed that their clients would get to know too much, and that their financial interests would be hurt. In the country districts in America, as a rule, the doctor was druggist too, and had a direct interest in the sale of drugs and proprietary medicines. (4) A very important difficulty was misinterpretation by the laity of their articles, and sensationalism of journalists. The only remedy for such troubles was reference to the original articles, and letters to the newspapers correcting misstatements. (5) What he might call the "bottle cult"—the idea so firmly fixed in the public mind that every ill that flesh was heir to could be cured by a bottle of medicine. This bottle cult had led to a reaction in certain hygienic cults which repudiated all drugs, such as the "sunshine cure," the "mud cure," etc. Even health administration depended on popular knowledge in a democratic country. It was impossible to carry out legislation unless the public co-operated. For instance, in the case of syphilis, regulations against this disease would not be carried out until the public was educated on the subject. It was most important to insist on educating children in elementary hygiene, to make hygiene a habit like surgical cleanliness, which could only be done by inculcating it in early youth. They had founded a Society of Social Hygiene in Washington which was not under the control of the medical profession, but had been restrained from unwise or rash acts owing to the influence of conservative medical men. They had endeavoured to prevent the establishment of the institute started in New York by Dr. Friedmann of Berlin, since they looked upon his treatment as quackery. They had been unsuccessful at first, but he was glad to say the institute had now been closed by order of the municipal authorities.

Dr. R. MURRAY LESLIE (London) considered that public exhibitions containing attractive exhibits dealing with health matters formed some of the most important means of educating public opinion. Great benefits had resulted from the tuberculosis exhibitions and conferences which had been held in London and many of the more important provincial centres. The use of the cinematograph in exhibiting health films had proved a most valuable method of inculcating practical lessons in elementary hygiene. This method was initiated by the Women's Imperial Health Association, and was now employed by other voluntary health societies. The systematic education in hygiene of the older girls in our principal schools and colleges was likely to prove of immense value. Health articles and bulletins in the local press undoubtedly assisted in moulding public opinion. The importance of judicious teaching in questions of sex, in the case of both boys and girls, could not be over-estimated. This question was closely connected with the problem of contagious disease, and it was a matter of congratulation that many of the leaders of the profession had recently advocated the appointment of a Royal Commission to institute an inquiry into this question.

Dr. WYNNE (M.O.H. Wigan) considered the work of the medical officer of health to be primarily educative. He had to educate his own committee, and the property owners, employers of labour, shopkeepers, and others with whom his work brought him into direct contact. He had to educate the midwives under his control, and the municipal hospitals should afford a hygienic training to the patients who passed through them. The work of the school medical officer, the school nurse, and the health visitor was almost entirely educational. The public were not so difficult to educate as was sometimes supposed, as was shown by the comparative ease with which the idea of the open window was assimilated by the consumptive, and especially in the successful educational work done in improving housing conditions on the principles inaugurated by the late Miss Octavia Hill.

Dr. MCWALTER (Dublin) thought there was one point that might be emphasized a little more. Many would remember Emerson's saying that individual effort was always in inverse ratio to the help given from outside. He thought that people were being so spoon-fed that they would do nothing for themselves. They were piling up burdens on the ratepayers to make people live healthily whether they liked it or not. They ought to try and establish a health conscience in the people by which every man and woman would feel bound to conform to high ideals of hygiene, which he might define as consisting of self-knowledge, self-reverence, and self-control. The hygienic ideal of every medical officer of health appeared simply to consist in a low death-rate. In his opinion it was not a very great matter to prolong the lives of hopeless sufferers from cancer and consumption. Instead of more lengthened days, he thought they should aim at broadening their outlook on life.

Major JACKSON, R.A.M.C., said he thought the President was in error as to university degrees in hygiene, as Dublin University was the first to grant a Diploma in State Medicine. In his experience there was considerable opposition by urban councillors to the medical officer of health, who was usually the best disliked man in the town, especially by jerry-builders and small property owners. He illustrated the ignorance of the generas public in scientific matters by describing a pair of bootl which he had been recommended by an enterprising stall-holder at the annual exhibition, containing a zinc plate in one heel and a copper plate in the other, between which, he was informed, when acted on by the moisture of the body, a current of electricity would flow, which would invigorate the whole body. When such inventions found their way even into an exhibition patronized by the Association it showed in a marked way the necessity for educating the public.

Venereal Disease.

The meeting concluded their business by unanimously passing the following resolution, on the proposition of Dr. MURRAY LESLIE:

> That a recommendation be forwarded to the Council of the British Medical Association endorsing the views expressed in the circular letter recently issued to the metropolitan public press by recognized leaders of the medical profession in regard to the question of venereal disease, and strongly advocating the appointment of a Royal Commission to inquire into this subject which so closely affects the public health.

THE International Association of Medical Psychology and Psychotherapy will hold its annual meeting at Vienna on September 19th and 20th. All communications relative to the conference should be addressed to the General Secretary, Dr. L. Frank, 45, Zürichbergstrasse, Zürich.

THE Association of French-speaking Paediatrists will hold its annual meeting this year in Paris on October 3rd and 4th under the presidency of Professor Netter. The questions proposed for discussion are obesity in children (to be introduced by Drs. Le Gendre of Paris, Mouriquand of Lyons, and Nathan of Paris); cerebral tumours in childhood (to be introduced by Drs. A. Broca of Paris, d'Astros of Marseilles, and F. Ferrien of Paris).

THE eleventh international conference on tuberculosis will be held in Berlin in October (22nd to 25th). Among the most important communications promised are the following: Professor Landouzy, Clinical Forms of Koch's Bacillosis at Different Periods of Life; Dr. Brauer, The Surgical Treatment of Pulmonary Tuberculosis; Dr. K. Frankel, Life Insurance; Professor Pannwitz, State Insurance and Schools for Children with a Tendency to Tuberculosis.

Seventeenth International Medical Congress.

THE SECTIONS.

SUMMARY OF PROCEEDINGS.

DIAGNOSIS AND TREATMENT OF TUMOURS OF THE BRAIN.

ON Monday morning, August 11th, the Sections of Surgery and Neuro-Pathology met together to discuss the treatment of tumours of the brain and the indications for operation. The meeting was held in the Jehangir Hall of the University of London, but many of the audience could find standing room only.

Sir David Ferrier, President of the Neuro-Pathology Section, was in the chair, and was supported by Sir W. Watson Cheyne, President of the Surgical Section. The audience was perhaps the greatest gathering of distinguished surgeons ever seen in London. It is not possible to name all who were present, but among the most notable were von Bruns (Hanover), von Eiselsberg (Vienna), Harvey Cushing (Harvard), Bastianelli (Rome), Sir Victor Horsley (London), Sir William Macewen (Glasgow), Babinski (Paris), J. B. Murphy (Chicago), Kocher (Berne). The reporters were Professor von Bruns, Professor Freiherr von Eiselsberg, and Dr. H. H. Tooth.

Professor von Bruns showed that the operative procedures for cerebral tumours fell into two groups: (*a*) Radical operations with extirpation of the tumour; (*b*) palliative operations for the relief of pressure, which might either be primary and devised for that purpose alone, or performed as a secondary resort when the radical operation for some reason could not be performed. The indications for the radical operations and the prognosis of those operations depended upon three things: (*a*) The nature of the tumour. The most favourable were the circumscribed tumours, and especially those that project from the surface. Unfortunately the clinical diagnosis between the common infiltrating glioma and the circumscribed sarcoma was still extremely difficult. (*b*) The possibility of certain general and local diagnoses. The general diagnosis might be difficult as against abscess, hydrocephalus, and the so-called pseudo-tumours. The local diagnosis was often impossible in the case of tumours in the right temporal and frontal lobes, and in the case of those in the semi-oval centrum and in the corpus callosum. (*c*) The accessibility of the tumour. Inaccessible were tumours of the third ventricle, and many in the substances of the hemisphere. All others were accessible, but with very different degrees of danger. Primary palliative operations were indicated if, while the local diagnosis was uncertain and the general diagnosis was certain, the general symptoms were very severe, as, for instance, when vision was affected and blindness threatened.

Professor von Eiselsberg spoke of the great difficulties in operating on tumours of the hypophysis. He had tried to attack these tumours by the nasal route, but thought the risk of operating through a passage not absolutely aseptic was great. He showed several specimens and pictures of cases operated on. He strongly advocated early operation, and held that it was inhuman not to operate on brain tumours.

Dr. Howard H. Tooth's report was really supplementary to one already made on the consideration of tumours of the brain if left to run a natural course. This present report concerned itself with the question of the results of surgical treatment. A high mortality was inevitable at the best, but this should not cause dismay nor any relaxation of efforts to relieve patients. After removal, partial or complete, of frontal tumours, he found that in glioma the average post-operative survival period was ten months; in endotheliomata, which pressed upon but did not infiltrate the brain and which could be removed without great difficulty, the mortality was 46.6 per cent. The tumours of the central region comprised 65 cases—glioma, sarcoma, carcinoma. Recurrence after removal was only a matter of time, and then in a more malignant form. The average post-operative survival period was ten months. The percentage of recoveries in endotheliomas was high—namely, 66.6. There were few cerebellar cases in his list, but there were four recoveries. Two tuberculoma cases died within two months after of tuberculous meningitis, though the growth was completely removed. Decompression by craniectomy in one or two stages was followed by an appreciable lowering of pressure. From his tables he could draw no general conclusion as to the ultimate value of the method. The first consideration seemed to him to be relief of pressure in the urgent cases where there was rapid increase in the size of the tumour. Most cases of declared intracranial tumour needed operation, perhaps sooner than later, and the risk had to be taken.

Professor Harvey Cushing said that the relief obtained after decompression in a relatively silent area might be very great. Many tumours were slow in growth, and might reach a large size before disturbance took place. There were many individual standards of what constituted recovery. If the word were given a very strict interpretation, none would see more than 5 per cent. of recoveries. But if the patient obtained after the operation freedom from discomforts, preservation of vision, prolongation of life, then the percentage of recoveries rose to 50 or 60. There could be no doubt that 10 per cent. would succumb after operation, even after such a simple proceeding as decompression; in the last 100 consecutive cases he found that 7 deaths could be attributed to the operation. In 350 tumour cases need for operation was certified in 200—40 per cent. were gliomas, 30 per cent. arose from glandular structures. In true endotheliomas there were none of the cellular fibrillae seen in gliomas—they were potato-like tumours which had point of origin from the dura. In 2 cases of enormous tumours there were no pressure symptoms and no changes in the ocular fundi. He had had 24 operations for tumours in the lateral recess of the cerebellum. To reach that area he strongly advocated the large crossbow incision, with, if necessary, removal of the posterior half of the foramen magnum. This permitted exposure of the medulla, and if respiratory difficulties arose he had removed the posterior portion of the atlas, while artificial respiration was being carried on, with restoration of respiration. It was wise to operate slowly in these cases and ensure complete haemostasis. His operations sometimes lasted four hours and often had to be done in three or four stages. Extremely delicate manipulation was necessary, with the greatest possible respect for brain tissue. These operations ought not to be crowded into a heavy morning's work—one such case was enough work for one day.

Sir Victor Horsley, who followed, said that what was more especially required was accurate histological diagnosis of tumours. The question of haemorrhage did not disturb him; hot irrigation, and the employment of oxygen and chloroform as the anaesthetic, would enable that danger to be avoided. Sepsis ought to be preventable. For his part, he thought these operations should be done antiseptically. For improvement all round earlier diagnosis had to be looked to, and that meant earlier operation. He blamed the writers of textbooks for their too rigid insistence on recognition by the doctor of the three great classical signs, headache, vomiting, optic neuritis, for these really appeared very late in the course of a case; they were end-results, and the patient ought never to reach the stage when they appeared; often by that time the tumour was irremovable and decompression only was feasible. Optic neuritis was a most valuable sign; if properly analysed and watched it might be found that it appeared first on the affected side. He agreed with von Bruns in recognizing the difference between a radical and a palliative operation, and held that operation might be done for differential diagnosis. In palliative operations he deprecated opening the dura mater as a rule.

Professor Krause (Berlin) had operated by local anaesthesia. He showed pictures of angioma of the brain and endothelioma growing from the dura.

Professor Claude (Paris) was strongly in favour of decompression to relieve symptoms. The family physician should be strongly urged to send cases to the surgeon much earlier.

Sir William Macewen said that the principal factors in his experience were the necessity for early diagnosis and localization of the tumour. Wherever physiologists made

certain of special points which bore on localization, surgeons were able to go in at the part and remove the tumour. Early diagnosis and early operation went together. The classical symptoms were stated too positively, for sometimes a tumour was present even in the absence of classical symptoms. He had found a large tumour, and removed it successfully, where the only signs were slight paresis of the right arm and contraction of the left pupil. In the motor area localization was definite and complete, but in other regions it was not so. Word blindness, mind blindness, word deafness, were symptoms which ought to be localizing symptoms, and he had successfully operated where these symptoms were present. He had no great belief in statistics. In some compilations it was said that surface tumours were easy to remove and deep-seated tumours were difficult; but that statement must be corrected. For example, he had successfully removed a large tumour springing from the lateral ventricle and choroid plexus which did not reach the surface. Tuberculous tumours had been removed; they were often quite definite tumours placed deeply more often than on the surface. Unfortunately, tuberculous lesions frequently broke out in some other situation. Relief was obtained by removal of syphilomata.

Mr. Leslie Paton spoke of one or two points as to which the opinion of the ophthalmic surgeon might be sought with regard to the prospect of return of visual acuity, and said that a commencing atrophy might be completely obscured and could best be gauged by loss of visual acuity. Progressive increase in swelling of the disc afforded a valuable indication of urgency, and if nothing else followed operation in urgent cases the most certain result was subsidence of swelling and active neuritis, with more or less complete recovery of vision.

Professor L. M. Poussepp (St. Petersburg) said that he had operated on 31 cases of brain tumour—16 cerebellar and 15 cerebral—and his general opinion was that success was not so much a matter of surgical technique as of precision in diagnosis, which could only be obtained by continued study of surgical neuro-pathology.

Dr. Byrom Bramwell (Edinburgh) thought that there were very few cases of intracranial tumour which could be completely and successfully removed by the surgeon. The whole matter turned on what they meant by "recovery." If the tumour were removed and the patient left hemiplegic or blind he had not recovered. His pathological experience convinced him years ago that the surgeon could do little or nothing, and he had not seen reason to alter that opinion. He agreed that it was advisable to operate in the earliest possible stage, and that early diagnosis was essential. But if the classical symptoms were, as had been said that day, really late in the pathological progress of the case, what were the earlier signs and symptoms? He thought that in cases in which diagnosis and localization were obscure a prolonged course of large doses of mercury and potassium iodide should get a thorough trial before operation. He was greatly impressed by the value of the decompression operation.

The debate was continued by Professor Sargent (London), Dr. de Martel (Paris), Professor Bianchi (Rome), and replied to by the reporters.

EARLY RENAL AND VESICAL TUBERCULOSIS.

ON Friday morning, August 8th, the Section of Surgery held a joint meeting with the Section of Urology to discuss the diagnosis and treatment of early renal and vesical tuberculosis. Sir W. Watson Cheyne presided and was accompanied on the platform by Mr. Hurry Fenwick, President of the Urological Section.

Professor Rochet of Lyons, in his report, deprecated any attempt to formulate definite and precise rules in a question so delicate and so diversely regarded by acknowledged authorities. In regard to unilateral kidney tuberculosis a "granular" lesion discrete and not deeply placed seemed inevitably to go on to an ulcerating and caseating stage with fatal termination, but there was no proof that this early condition did not as in other organs heal. The diagnosis of this early granuloma not yet ulcero-caseous was obscure and difficult. In a patient suspected to suffer from early tuberculous disease, and in whom the urine from one kidney contained bacilli with positive inoculation of guinea-pig, he would not advise immediate operation, but he would wait for three new conditions to develop: (1) a slight degree of pyuria, (2) a certain diminution of the functional value of the diseased kidney, and (3) such complications as serious repeated haemorrhages, pyrexia, anaemia, bladder symptoms. Whenever symptoms pointed to formation of ulcer or caseation, operation was called for. During the time the case was being watched after suspicion was aroused the patient could be treated with general medical means. As to specific treatment by tuberculins, antituberculous serums, and immunizing substances, he had to admit that his experience was limited, though from what he knew he did not think they could do all that was claimed for them. The treatment by the immune bodies of Spengler he did employ in the expectant period, and, he thought, with some success; these bodies were obtained by extract from red blood cells of rabbits immunized to tuberculosis. In bilateral kidney tuberculosis the lesions were probably not equal on both sides. In these conditions specific treatment was indicated. Early tuberculous infection of the bladder, in so far as it was almost inevitably due to secondary infection from the kidney (90 to 95 per cent.), was cured when the kidney was treated. In treatment of bladder disease, persisting after nephrectomy, or in the few cases of primary infection, or after infection from genital organs, he advocated washing the bladder with creosote solution and administration of pills composed of iodoform, sodium arseniate, and creosote. Specific treatment could be used only in cases where vesical infection was associated with advanced renal and genital disease.

Dr. Hans Wildbolz, who also presented a report, observed that early tuberculosis did not refer simply to the patient's first symptoms, as he had known cases to be tolerably advanced before the patient sought advice. He had found a kidney three parts cavernous in a patient who had complained of urinary symptoms for only ten days. In over 300 cases of tuberculous kidney examined by him only 25 were in the early stage; in all the others the disease was advanced. He indicated some symptoms which drove the patient in the early stages to his doctor: Disturbance of general health, lessened vigour and ability for work; local signs referred in more than two-thirds of the cases to the bladder (Rafin)—43 per cent. of his own cases had complained of cystitis; kidney pain of dull or occasionally neuralgic character; frequency of micturition, sometimes incontinence; pain in bladder even before that organ became infected; haematuria, a common early sign (out of 300 cases he found it only twice as the first symptom) was sometimes very severe. Then the urologist was able for himself to observe persistent slight albuminuria, polyuria, alterations in blood pressure (it was necessary to exclude chronic nephritis, in which polyuria and albuminuria were also found), acidity of the urine, pyuria (cystoscopic examination often negative, though he had observed redness and infiltration of mucous membrane not specifically tuberculous). In 70 to 80 per cent. of all cases tubercle bacilli were found in centrifugalized urine, but inoculation experiment was the surest test. It had to be kept in mind that tuberculous bacilluria had been found in cases of phthisis where neither kidney, bladder, nor genital organs were infected. The diagnosis of tuberculous disease of the kidney with present-day methods could be made with certainty only when pus cells and bacilli were found in the urine of that kidney whose function was unmistakably, though slightly, disturbed. For tuberculin treatment in the early stage more claims had been put forward than for any other. But it seemed to him that for only very few recorded cases could the claim of permanent cure be sustained. He gave his own experience of 13 carefully observed cases in which treatment had been conducted for from one to four years, and his conclusion was that not a single one of them could be said to be cured, and 8 later required nephrectomy. The results of early nephrectomy seemed on the whole good, but the cases were too few to found conclusions upon. He believed, however, that as soon as unilateral tuberculous disease of kidney was with certainty diagnosed, that kidney should be removed.

Dr. A. Fullerton (Belfast) pointed out that the disease might progress very rapidly so as in a few weeks to render the patient's life intolerable, or it might go on for ten years with little disturbance. Spontaneous cure was not to be relied upon. He had had only three cases of

primary disease of the bladder. The absence of pus and albumen were not absolute proof of the integrity of the kidney. Tubercle bacilli were found in 80 per cent.; frequent examinations for the bacillus were necessary. The cystoscope and ureteral catheter were the most important instruments of diagnosis. Removal of the affected kidney was the only absolute cure.

Professor Kümmel (Hamburg) had had 60 per cent. cures after nephrectomy. Tuberculin was, on the whole, a dangerous form of treatment, because it raised false hopes on account of the undoubted improvement following its use in the first weeks or months.

Dr. Van Houton (The Hague) treated bladder infection, which was always secondary to kidney disease, with silver nitrate solution, ½ to 2 per cent. injected once weekly.

Mr. Leedham-Green (Birmingham) was of opinion that the only cure was removal of the diseased organ. He was doubtful, however, whether early tuberculous infection did not sometimes heal spontaneously as it did in other parts. So long as the function of the kidney was unimpaired he would not remove it. Clinically it was difficult to estimate the stage of the disease. In children the attitude should be one of extreme caution, because in them he had found tuberculous bacilluria with few pus cells or none and good functionating kidneys.

Dr. David Newman (Glasgow) demonstrated by the projectoscope the cystoscopic appearances in early renal and vesical tuberculosis. He pointed out that the most characteristic feature of the symptoms (polyuria, slight pyuria and albuminuria, occasional haematuria) was their tendency to remission, and in that lay a serious danger in so far as both patient and doctor were deceived. The premonitory symptoms of tuberculosis could appear long before the development of a gross renal lesion. In this stage cystoscopy was most successfully employed. When a kidney was tuberculous the orifice of the corresponding ureter indicated the nature of the lesion by changes in the colour and contour of the lips of the orifice, by the size, frequency and regularity of the "shoots" of urine, and by the character of the urine which escaped. His conclusions in primary renal tuberculosis were:

1. When the ureteral orifice was normal no serious disease existed in the corresponding kidney.
2. When the kidney was normal the orifice of the ureter also was normal.
3. Evidence of tuberculosis at the orifice was associated with tuberculosis of the corresponding kidney.
4. In tuberculosis of the bladder the ureter did not become involved if the corresponding kidney were free from disease.

The first feature of early tuberculosis of the bladder was marked anaemia of the mucous membrane with obscuring of the cystoscopic field and of the vessels in the mucous membrane due to oedema. Next came hyperaemia; this led to the appearance of minute nodules like boiled sago grains beneath the epithelium of the mucous membrane. These were at first scattered, then they became opaque and confluent. The opacity indicated caseous degeneration; then the blood vessels around became engorged. On removal by washing of pale flecks of mucus or shreds of necrosed mucous membrane an irregularly eroded surface showed itself surrounded by a zone of hyperaemia. Two or three such ulcers were present, and also miliary tubercles were seen often in the trigone. The ulcer might involve the submucosa, exposing the muscular coat. Treatment by curettage was very successful. Lastly, he observed that the bladder offered considerable resistance to the tubercle bacillus, as shown by experiment. But if other organisms were present the resisting power of the mucous membrane was weakened and secondary infection was almost sure to occur.

Professor Rovsing (Copenhagen) was doubtful of the possibilities of early diagnosis, and thought that these very early cases rarely came to the surgeon. After removal of the tuberculous kidney, the tuberculous bladder quickly recovered; to assist this he injected 6 per cent. carbolic acid. The efficacy of tuberculin seemed to him so problematical that its use should be limited to inoperable cases.

Mr. Hurry Fenwick (London) held that early cases of kidney mischief were diagnosable by the cystoscope. Even only three weeks after onset of symptoms he had found thickened ureter and intravesical signs. He had used tuberculin constantly for fifteen years in small doses and found that the patient's general condition improved nearly always. He believed it acted as a tonic. Greater knowledge of this disease was to come from study of its progress in the female patient. Nephrectomy was a perfectly safe operation if performed with rigorous asepsis; the mortality need not be over 3 per cent.

TREATMENT OF SYPHILIS WITH SALVARSAN AND ALLIED SUBSTANCES.

On Monday, August 11th, the Sections of Dermatology and Syphiligraphy and Naval and Military Medicine met together to discuss the use of salvarsan and allied substances in syphilis. The meeting was held at the Governors' Hall of St. Thomas's Hospital, which was crowded to its utmost capacity with the best known syphilologists of every country, and must rank as an historic occasion, not only because Professor Ehrlich was himself present to open the discussion, but because the assembly was more representative of the world of medicine than any which has taken place since the successful synthesis of the preparation by Ehrlich and Hata in 1910. Sir Malcolm Morris K.C.V.O., and Sir Launcelot Gubbins, K.C.B., Director-General, Army Medical Service, presided.

Professor Ehrlich, on rising to open the debate, was received with great enthusiasm, and his graceful and modest acknowledgement of the acclamations will never be forgotten by those who had the privilege to be present. After referring shortly to the organic chemical structure of salvarsan, Professor Ehrlich said that he agreed with those who had found that its action on the spirochaete was indirect, and in the nature of a complement fixation reaction, for salvarsan by itself *in vitro* did not kill the organisms, although if the mixture of salvarsan and living spirochaetes were injected *in vivo*, their death and dissolution was immediately brought about. He believed, with many other observers, that salvarsan was not neurotropic, nor did his experiments with rabbits which he had injected with daily doses of from 0.02 to 0.05 gram for three months—a course of treatment they had happily survived—suggest at the subsequent *post-mortem* examinations that any of the organs or tissues had in any way suffered from the drug. It was only with doses of 0.1 to 0.12 gram of the alkaline solution that the animals were killed, the acid solution being still more poisonous. The febrile reactions about which so much had been written were due either (1) to technical errors in the administration, or (2) to the toxins generated on the dissolution of the spirochaetes, a phenomenon which might be prevented by a preliminary treatment with mercury. It must be remembered, he said, in this connexion that salvarsan killed a great number of other organisms the liberation of whose toxins were doubtless often in part responsible with those of the spirochaete. Recurrences he believed to be the result of insufficient dosage. In discussing the mortality, he observed that chloroform was annually responsible for a much higher percentage of deaths than salvarsan, and he was convinced that the small number might be even further reduced by instituting a careful search in all cases about to be injected for the contraindications—for example, renal inefficiency, Addison's disease, status lymphaticus, and advanced cancer.

The very occasional occurrence of deafness four to five hours after an injection was due to swelling and compression of the auditory nerve in its bony canal, whilst late deafness with commencing cerebral symptoms probably indicated the advance of a basal meningitis, and were manifestations of a true Yarisch-Herxheimer phenomenon. Further injections in such delayed cases (two to five days) would be to pour oil on the fire, accelerate the advance of the meningitis, and kill the patient.

In doubtful cases he advised the trial injection of 0.1 gram doses at intervals of four days, a procedure of which Professor Neisser had approved. He would listen with great interest to the views of the eminent colleagues who would speak after him, on the possibility of sterilizing the early cases, whether the treatment should be combined with mercury administration or not, and whether any good results had been obtained from its administration in the parasyphilitic affections.

The President proposed a vote of thanks to Professor Ehrlich for contributing so illuminating an address to the

discussion, and this was passed by both Sections with acclamation.

Professor Neisser (Breslau), who is seriously ill, had sent his regrets for his unavoidable absence, and a print of his most valuable paper was distributed among the members. It dealt chiefly with the clinical application, contraindications, and neuro-recurrences, which he also ascribed to insufficient treatment with salvarsan. He denied a neurotropic influence and claimed a specific action for the preparation on the *Spirochaeta pallida* in particular—an action which, in his opinion, was considerably enhanced by the combined exhibition of mercury in the form of injections of grey oil. He recommended two complete courses of salvarsan and mercury, even in early primary cases.

In the paper by Lieutenant-Colonel Gibbard and Major Harrison, R.A.M.C., the result of their work at the Military Venereal Hospital, Rochester Row, contained some striking statistics, which, in view of the complete disciplinary control of every case, are perhaps the most perfect testimony to the economic value of the drug. It was stated that when mercury alone was used for treatment there were 83 per cent. of clinical relapses, but that since the introduction of salvarsan only 5.1 per cent. had recurred. The summary conveyed the important conclusion that the best results were obtained with a course of two intravenous injections of 0.6 gram of salvarsan and nine intramuscular injections of mercury prolonged over ten weeks, and that such a combination had effected an annual saving to the State of 70,000 to 80,000 hospital days, an economy equivalent to the cost of keeping a battalion of infantry in hospital for three months.

Professor Wassermann confined his remarks to the influence of salvarsan on the serum test that bears his name, and the main point he brought out—and it was perhaps the most important point in the whole debate—was the absolute necessity of examining the cerebro-spinal fluid of every syphilitic at least once in the course of the first year after infection, for the Wassermann reaction. Syphilis, he maintained, once it had produced clinical symptoms of cerebro-spinal involvement, could not be eradicated from the system, and a positive Wassermann reaction in the cerebro-spinal fluid was in his opinion the indication of the possible onset of these, and must be the signal for energetic and prolonged administration both of "606" and Hg, till the reaction became negative both in the serum and the lumbar spinal fluid. He concluded by registering his opinion that salvarsan was the mightiest weapon in medicine.

After Professor Hallopeau had spoken shortly, Dr. MacCormac (London) read a paper by Sir Malcolm Morris and himself on their experience of 500 cases of salvarsan administration at the Seamen's Hospital without a single death. They were of opinion that the occasional severe reactions which had followed the second injection were manifestations of the anaphylactic state.

Dr. Leredde (Paris) believed that all failures were due to insufficient and too short treatment, and Mr. J. E. R. McDonagh, who followed, happily characterized these as "spasmodic" administrations of "606" which were worse than useless. The latter claimed that "606" had no effect on the spore stage of the life-cycle he had described for the spirochaete, but only affected the gametic elements.

Dr. Saalfeld (Berlin) said he had avoided local inflammatory reactions entirely since he had diminished the bulk of his excipient (sterile water) to 40 c.cm.

Dr. Basch (Budapest) strongly condemned ambulatory administration, in that dietary indiscretions, alcoholic excess, etc., could not be controlled in out-patients.

Dr. Berry (Paris) had some remarks to make on a new chemical product containing arsenic, mercury, and an iodide; and Dr. Lévy-Bing (Paris) had seven failures to chronicle in the form of clinical recurrences in primary cases collected from the third to the fifteenth days after the appearance of the chancre. He was followed by Ehrlich's collaborator, Professor Hata, who had most encouraging statistical proof to offer, in 166 cases of syphilis, primary, secondary, and tertiary. His experiences in a disease indigenous to Japan, known as "rat-bite fever," had been most remarkable, inasmuch as after one injection in each of 16 cases, in 15 the periodic febrile attacks disappeared completely, and in the sixteenth after a second injection.

Professor A. Blaschko, the eminent Berlin syphilologist, advised caution in speaking of complete cures; he thought they should reserve a definite pronouncement for another ten years. He discussed the contraindications, instancing especially chronic alcoholism and nicotine poisoning.

Dr. Fordyce (New York) had given 7,000 injections with only one death. He agreed with Professor Neisser in that at least two courses should be given, in combination with Hg, even in early primary cases—a procedure which usually cured the secondary cases also, but rarely the severe tertiary. He had been very successful with the syphilis of pregnancy, both as regards the mothers and their infants, and had met with cases of tabes in which the symptoms had been considerably ameliorated by intensive treatment with the drug.

Dr. Schreiber announced some excellent results in the treatment of the prostitute class at Magdeburg. In the past two years the Wassermann reaction had been carefully registered in every case and appropriate treatment adopted, and the women themselves had begun to realize the benefits of the system, so that they were voluntarily presenting themselves for treatment now in increasing numbers, and a very considerable advance towards the ultimate sterilization of the disease at the fountain head was being made.

Dr. McIntosh said he had proved experimentally that salvarsan was non-toxic for healthy individuals by the absence of any sort of febrile reaction after its injection in the normal human subject.

After Dr. Ullmann (Vienna) had stated that there was now no *anti-salvarsan* party, Professor Yadassohn (Berne), who ranks as one of the greatest of living dermatologists, admitted that he had had a very considerable percentage of neuro-recurrences, and he was there to admit his conviction that these were due to the use of small, insufficient doses, of which practice he himself had been the initiator on the ground of caution. By this means he had detected cases of idiosyncrasy, etc., which might otherwise have been sacrificed to the drug; in his opinion it was a case of the choice of two evils. (Professor Ehrlich was seen to applaud this speaker's remarks.)

After Major Harrison had replied for the reporters, Professor Ehrlich recorded his conviction that the morning's discussion had marked a great advance. He was glad to find that they were all agreed on the main point—the utility of salvarsan. As regards the dosage, there would seem to be dangers both from the administration of too much on the one hand and too little on the other, and it was therefore most important—as more than one speaker had emphasized—that only those of wide experience should be entrusted with the administration of the remedy.

ROENTGEN AND RADIUM THERAPY IN GYNAECOLOGY.

THE spacious Chemical Theatre of the Imperial College was crowded to overflowing on Monday morning, August 11th, when the Section of Radiology joined forces with that of Gynaecology for a discussion on the question of radio-therapy in gynaecology. The opener was Dr. Albers-Schönberg, who expounded his "Hamburg method" in the application of x rays, and devoted himself principally to a consideration of their influence upon myomas. The care of his technique, he said, lay in the application of only as much radiation as was necessary to secure the result, irrespective of the long or short duration of treatment. In 33 cases which he instanced as having been brought to a successful issue, the average duration of treatment was between six and seven months. In a noteworthy percentage of cases, he said, there was a direct influence upon the tumour cells, resulting in their depression or disappearance. The proportion of favourable results in this condition was very high—he gave an imposing array of statistics—and the permanency of the cure might be taken for granted in suitable cases. Not all myomas were suitable for Roentgen treatment, some proving refractory. The exact limits of x-ray influence would doubtless in time be determined, but a percentage of cases were reserved for operation. With the advent of careful technique Dr. Albers-Schönberg thought that the danger to the

skin might now be practically disregarded, though whether any late reaction was to be apprehended must be left for the future to reveal. The distinguished Hamburg radiologist also touched upon the therapeutic applicability of the characteristic secondary rays of metals. He thought that the effect of these rays could be demonstrated on a biological scale, and also suggested that it was secondary radiation which played an important part in the therapy of mesothorium.

He was followed by Dr. Foveau de Courmelles (Paris), who commended this new gynaecological departure in high terms. Early fibromata, he said, even when of large size, yielded rapidly to *x* rays, applied externally through an aluminium filter. Pain and haemorrhage and the sense of weight first disappeared. The intensity must vary with the radio-sensitivity of the patients, just as the number of sittings must depend upon the duration of the growth. At about the menopause the action was more rapid and decisive, even on an old fibroma. When *x* rays failed to maintain their influence, he had found a subsequent radium application—from 1 to 5 cg. around or in the neck of the uterus, retained in position from six to twenty-four hours—retrieve the therapeutic action, at all events if the fibroma were in the earlier stages of its development. Perhaps the most interesting passage of his report was his description of the gynaecological applications of radium. In malign tumours his personal statistics had reference to 100 inoperable cases, 70 of which had shown ameliorations lasting from one to four years. Among other effects which he noted was the diminution and afterwards disappearance of the metrorrhagia, also the disappearance of the leucorrhoea and fetidness, and the diminution, frequently the suppression, of pain. His method was to introduce aseptic tubes within the tumour, the intensity and duration varying with the case, from a minimum of 5 cg. for twenty-four hours, and to repeat the applications monthly.

Professor Paul Kroemer (Greifswald) dealt more especially with the action of mesothorium and *x* rays in genital and intestinal cancers. In his total of 32 cases the results in uterine, vaginal, and rectal growth were favourable; he could not say the same of ovarian. Four cases were illustrated by photomicrographic records before and after treatment. The first of these, a metastasis in the vulva, was cured clinically by the injection of a solution of thorium X. Time would show whether or not the gain were permanent; it could only be said at present that the patients felt better after radio-therapy than after operation. Operation, after all, only cured 20 per cent. of the cases; for the remainder mesothorium and *x* rays offered apparently the only hope.

Some remarkable instances of the effect of mesothorium in carcinoma of the uterus also figured in the remarks of Professor Albert Döderlein (Munich). Striking modifications, evident in the microscopical sections, were measurable within a brief period of weeks.

Professor Jacobs (Brussels) said that the results he had obtained by the employment of radium in massive doses in uterine and vaginal cancers, many of the cases being relapses after operations, led him to the conclusion that this was a most desirable treatment. He used two tubes of radium (12 to 20 cg.), keeping them in the tumour for twenty-four or thirty-six, or even occasionally forty-eight, hours, and repeating these applications every ten or twelve days during four or five weeks. The results were recognized in the course of two or three months. He had submitted to this heroic treatment more than 24 cases of cancer of the uterine neck, and all had been favourably influenced. The cases were not of sufficient duration for him to speak definitely of cure, but in 3, in which he gave detailed accounts, the women being 44, 39, and 70 years of age, the lesions had shown no tendency to recur in from two to three and a half years. For some reason cancer of the external genital organs did not retreat so well under this treatment; perhaps the quantity of radium employed was insufficient.

The chastening note of scepticism was sounded by Professor Wilhelm Nagel (Berlin), who had failed to see results justifying any particular enthusiasm. The tumours had a habit of remaining just as they were. It was true that haemorrhage sometimes stopped, but it returned again after a while. The results described that morning were not better than those which had been obtained by other means. Indeed, Dr. Foveau de Courmelles did not say that he had cured a single case out of his hundreds; he only said that he had not found operation necessary. The prophecy had been made that this new method would supplant the old. He could only repeat a saying which he understood had gained some popularity in this country, "Wait and see."

Dr. Fedor Haenisch was the speaker of the morning to enter most minutely into his technique, giving the exact data for *x*-ray treatment of fibroids as used now at his institute in Hamburg. He also compared the Hamburg and Freiburg methods, and said that the difference between them, taking into account the recent modifications of the former, was not so great as it seemed if the respective sizes of the point of entrance were considered. His practice was to maintain a distance of 23 cm., a filter of 2 mm. aluminium, a current of 4 to 5 ma., a spark gap of 20 to 24 cm., and to give exposures of five or six minutes, the dose at each sitting being 4 to 5 Kienböck X units, on four consecutive days, followed by a two or three weeks' interval.

Dr. Walter Tate (London) said that radium treatment in this country was still in an experimental stage. No one could doubt the remarkable value of the new therapeutic agents, and he believed that radium had a considerable field as an adjunct to the surgeon. The introduction of a radium tube after operation for uterine carcinoma might improve the result; but it was a different matter to try radium in the treatment of carcinoma when the case was amenable to surgical operation.

Dr. G. E. Pfahler (Philadelphia) made the point that the tumours continued to regress for long after the *x*-ray treatment was concluded. He instanced a case in which a large tumour was reduced progressively until it had quite vanished at the end of the sixth year, although no radiation had been applied since the end of the first.

Professor Bernhard Krönig, Dr. Degrais, and Dr. Cheron having spoken, the final contribution to the discussion was made by Dr. Herbert Spencer (London), who warned all and sundry against the evident possibility of patients being submitted to radium treatment for myoma without having been examined by an expert gynaecologist. The danger of malpractice appeared to be considerable. Another important point to remember was that irradiation might involve sterility, temporarily at least, if not permanently.

ENDOGENOUS METABOLISM OF PROTEINS.

ON Tuesday morning, August 12th, the Section of Physiology and the Subsection on Chemical Pathology held a joint discussion on endogenous metabolism of proteins. Professor Hopkins (Cambridge), President of the Subsection of Chemical Pathology, was in the chair.

The discussion was opened by Professor Abderhalden (Halle), who commenced his remarks by observing that protein metabolism could not be discussed apart from that of fats and carbohydrates. He went on to describe his method of watching with the polarimeter the breakdown of polypeptides. Each substance had its own specific rotation, and therefore the formation of new substances could be seen by the change of rotation of the fluid under consideration. It was thus possible not only to estimate the substances formed but also their rate of formation and the total time of breakdown of any particular substance. Thanks to methods of identifying and isolating amino-acids from the blood, it was now possible to gain a much greater insight into the form in which these bodies were brought to the various cells and the way in which they were built up in the cell itself. Cells could also split albumins to amino-acids, and he had found that the juice of an organ would split the albumins of that organ, and of that organ only. To this there was, however, one exception—namely, the kidney, the juice of which would not only split kidney albumin but would also split the albumin from all other cells. Another interesting question was whether these albumin amino-acid syntheses and breakdowns were reversible actions. Present evidence tended to show that this was the case. Albumins of the food were broken down to amino-acids in the alimentary canal, the breakdown being in steps; it was at present uncertain whether this breakdown was complete or no. Feeding with carbohydrate-free diet proved that sugars could be formed from amino-acids.

The report of Dr. Dakin (New York), who was unable to attend the meeting, was then read by the Chairman. It dealt with the intermediary metabolism of proteins and carbohydrates. Modern research tended to show that the simple amino-acid products of protein digestion in the alimentary canal were re-synthetized after absorption by the body's own cells; but it was also noteworthy that almost all tissues possessed intracellular enzymes which could convert its proteins and carbohydrates into the same simple products. These latter were much more stable than the more complicated molecules, and there was good reason for believing that the most active changes in the cell were to do with them. The problem under discussion, therefore, essentially concerned the interrelations of glucose and the alpha amino-acids. An intermediary link was necessary, and the evidence of present work showed that it was to be sought in the alpha-ketonic aldehydes or glyoxals. Lusk and others had shown by feeding amino-acids to the glycosuric animal, emptied as far as possible from tissue glycogen by repeated phloridzin injections, that certain of them, such as glycine and alanin, were converted almost quantitatively to glucose; certain others, such as tyrosine, yield no glucose, but only the acetone bodies. He had himself carried these investigations further and had shown that amino-acids could be divided into two great groups: those giving glucose under these conditions and those giving acetone bodies. In the first group were all those containing 2, 3, 4, or 5 carbon atoms. None of the aromatic acids yielded glucose. Glucose must, therefore, be regarded as a very probable intermediate product of protein digestion. Further researches made it probable that the intermediate substance required between lactic acid and alanin on the one hand and glucose on the other was methyl glyoxal, and that an intermediate product between the latter and glucose was glyceric aldehyde. He also brought forward evidence that all these reactions were reversible—for instance, the formation of lactic acid from methyl glyoxal was brought about by a ferment glyoxalase, which he had found to be present and extraordinarily active in a large number of tissue extracts. All the reactions required were chemically possible, and he gave evidence to show that they actually occurred.

Professor Embden (Frankfort), who followed, was also concerned with this question of the conversion of proteins to sugars, and vice versa. He also considered that methyl glyoxal was a most important intermediary step in the conversion of alanin to grape sugar. He considered that lactic acid and glyceric aldehyde were intermediary steps between methyl glyoxal and grape sugar. He also outlined another line of chemical change through methyl glyoxal to acetaldehyde and acetic and aceto-acetic acids. All these actions were reversible; many of them could be proved to occur by perfusion experiments through the liver.

Dr. Cathcart (Glasgow) thought that there was a tendency to lay too great stress on the conclusions drawn from the perfusion of isolated organs, from the use of extracted tissue juices, etc. It was forgotten that there was such a thing as correlation of organs and tissues; that in the use of isolated tissues it was possible that some inhibitory or excitatory mechanism might be omitted. He did not, however, desire to belittle in any way the useful and suggestive results obtained by these experimental methods. In conclusion, he briefly described some experiments carried out in conjunction with Mr. Lang on the effect of small amounts of glucose, superimposed on an oil diet, upon the endogenous protein metabolism.

Professor Folin (Boston, U.S.A.) thought that the chemical experimental results were more applicable to pathology than to physiology. He discussed the fate of protein absorbed from the intestine with particular reference to the results he had obtained by his new methods.

Professor Zunz (Brussels) spoke of the relation of the carbohydrates and fats to protein metabolism and of the nature of the breakdown of the protein molecule. The presence of bread in the stomach in dogs retarded greatly the digestion of the proteins of meat, but not that of its own proper proteins.

Dr. Cramer (Edinburgh) discussed the influence of carbohydrate on the protein metabolism, and brought forward evidence that nitrogenous organic substances could be built up from ammonia and non-nitrogenous substances. This occurred in the fetus, which used circulating carbohydrates for the formation of its protein. He thought that the results obtained by the perfusion of isolated organs could be directly applied to the discussion of the fate of protein in the tissues as a whole.

Dr. Clowes (Buffalo) thought that too much importance might be attached to perfusion experiments of isolated organs.

Professor Freund (Vienna) referred particularly to the course of digestion in the intestine and then to the course of normal protein catabolism in the body. He spoke of the great difficulty of finding breakdown products in the blood, and directed attention to the very considerable flow of protein into the intestine contained in the succus entericus.

Professors Abderhalden and Embden briefly replied.

THE VALUE OF RADIOGRAPHY OF BONES AND JOINTS.

The Sections of Orthopaedics and Radiology met together on Tuesday, August 12th, to discuss the value of the radiography of bones and joints in orthopaedic surgery.

Dr. G. Nové-Josserand (Lyons) said that radiography rendered possible the study of deformities in the living and during growth. It permitted their recognition, the accurate determination of their morbid anatomy, the distinction of their varieties, the description of their evolution, and the definition of the architectural alteration of bones which resulted from them. It supplied, therefore, information which was valuable both for diagnosis and treatment. It had increased the clinical knowledge of deformities, and had shown the existence of varieties previously unknown and the relations existing between them. Its importance was specially great in the study of congenital scoliosis, of the disease of Dupuytren-Madelung, of congenital dislocation of the hip, of deviations of the neck of the femur, and of flat-foot.

Dr. Paul Redard (Paris) said that radiology, in combination with clinical examination, increased the accuracy of diagnosis and prognosis, and gave to treatment an exactness and precision hitherto unknown. It was, he said, impossible to study a deformity in the living body properly without the aid of radiography. The discovery of Roentgen had been as fruitful for orthopaedics as that of the laryngoscope for laryngology or the ophthalmoscope for diseases of the eye. Much, however, remained to be done, and efforts should be directed to perfecting the technique, which as yet did not always afford results possessing the necessary precision. Stereoscopic radiography was incontestably superior to the ordinary, and it was to this method that special attention should be paid in the future.

Dr. Fedor Haenisch (Hamburg) insisted upon the importance of the study of the normal osteology, as shown by the Roentgen rays. All the abnormalities of bones likely to be found must be known so as to avoid mistaking them for the results of trauma or of disease. In speaking of epiphysial lesions, he said that some cases of supposed birth palsy were really cases of displaced upper epiphysis of the humerus, with rotation of the rest of the bone. These were curable by operation on the bone. He spoke of the importance of radiography in fractures and in scoliosis, referred to Max Böhm's researches on this subject, and to its value also in controlling treatment. The early diagnosis of spondylitis in Pott's disease was of the very greatest importance, and was best attained by the x rays; the presence of abscess was readily discovered by this means. Lesions of the pelvis or parts of it, hip disease, and congenital dislocation of the hip, could all be diagnosed and their treatment controlled by the help of x rays, as also coxa vara, and injuries of the head and neck of the femur. He referred to Preiser's work on abnormal situations of the acetabulum, and its influence on the production of arthritis deformans; to Schlatter's disease of the tubercle of the tibia; to abnormalities and injuries of the bones of the feet, such as spurs of the os calcis; to abnormal number of ossification centres in the cuneiform bones; to tuberculosis of the foot and fracture of the metatarsal bones; myositis ossificans and bone tumours were also to be mentioned.

Dr. Paul-Vital Badin (Paris) read a communication on the importance of radiography in the study of flat-foot in adolescents. He explained by diagrams that in the normal

foot the relative position of the tarsal bones was little different in the unloaded foot and in that bearing the weight of the body, while in flat-foot the position changed very much.

Dr. Finzi (London) showed photographs and radiographs illustrating Madelung's deformity of the wrist, which is characterized by a subluxation of the carpus forwards, causing undue prominence of the lower end of the radius. These radiographs showed that the deformity in these particular cases was not due to bowing of the shaft of the radius but to irregular ossification at the lower epiphysis with turning inwards of the articular surface of the radius.

Professor Froelich (Nancy), who followed, showed on the other hand radiographs of cases in which a general curvature of the shaft of the radius, convex dorsally, was the cause of the deformity. There is probably no one pathological entity responsible for the symptoms of Madelung's deformity, which may have various causes.

Mr. R. C. Elmslie showed radiographs of cases of supposed hip disease in which the symptoms were really due to irregular and imperfect ossification of the upper end of the femur. These cases were supposed to be cured by treatment for hip disease.

Dr. Mauclaire showed radiographs of coxa valga, etc.

TREATMENT OF THE NOSE, THROAT, AND EAR IN INFECTIOUS FEVERS.

ON Monday, August 11th, the Sections of Rhinology and Laryngology and of Otology held a joint discussion on the special treatment of the throat, nose, and ear during the active stages of certain infectious fevers—namely, scarlet fever, measles, German measles, mumps, influenza, typhoid, whooping-cough, small-pox, chicken-pox, erysipelas, anterior poliomyelitis, and cerebro-spinal meningitis. Diphtheria was excluded.

The discussion was opened by Dr. E. W. Goodall (London), who considered the subject under four heads: (1) The morbid condition of the fauces, nose, and ear in the diseases mentioned. (2) The results, temporary and permanent, local and general, of these morbid conditions. (3) The class and proportion of cases in which these conditions occurred; and (4) the treatment, both local and general. In most of the diseases in question, though by no means in all of them, the primary lesion, he said, was in the fauces and nasal passages, and the neighbouring cavities were secondarily affected by direct extension of inflammation. He discussed the various diseases in the order of the frequency of the faucial lesions; twelve diseases in all were mentioned, commencing with scarlet fever and ending with anterior poliomyelitis. Speaking of the results of these morbid conditions, he said if complete deafness supervened in a child who had not yet learnt to talk, deaf-mutism might result; but he had met with only one such case during an intimate association with fever hospitals extending over twenty-three years. In certain of the acute infectious diseases permanent deafness might result without previous otitis media. In mumps it was usually due to otitis interna, but in some cases it might be caused by a cerebral lesion. Passing to the class and proportion of cases in which the morbid conditions occurred, he said the more extensive, deep, and persistent the lesion, and the younger the patient, the higher the probability of the invasion of the ear and other cavities, structures, and organs adjacent to the fauces. Measles and influenza formed an exception. In neither of those diseases, and especially the former of the two, was the faucial lesion severe, and yet otitis and other sequelae were common. The infectious diseases which were most responsible for otitis were scarlet fever, measles, cerebro-spinal meningitis, influenza, small-pox, and typhoid fever. As regards scarlet fever, the statistics published by the Metropolitan Asylums Board showed that since the year 1899 the incidence of otitis had varied from 11.4 to 15.6 per cent. Probably at the present time scarlet fever and measles were about equal in their power to produce otitis. He considered the treatment under two headings: (1) To prevent or check the results mentioned, and (2) to render the patient free from infection. The object of the local treatment was to abate or limit the local inflammation. For the treatment of the nasal passages douching with boracic or alkaline solution was in most cases all that was required. In his opinion it was not necessary to employ local treatment in cases in which the fauces alone were not affected. In a large majority of cases the first sign that the ear had become affected was the occurrence of a discharge. The chief care, therefore, was three-fold—to provide for free drainage for the discharge, to cut short the inflammation, and to prevent secondary septic infection. To secure the first of these objects it might be necessary in a few cases to enlarge the opening in the membrane caused by the disease; the second and third objects were attained by gently syringing out the ear with antiseptic and astringent lotions. Dr. Goodall gave statistics to prove that these measures were efficacious in the majority of cases. Within recent years he knew that it had been advocated in certain quarters that if an otorrhœa persisted for more than six weeks the antrum, and, if necessary, the mastoid cells, should be opened up, or even the complete operation performed, though there might be no evidence that these structures were involved. Dr. Goodall was of the opinion that such a proceeding was not justifiable except in the most chronic cases, and that a prolonged course of treatment on the lines he had indicated should be carried out before resort was had to operation, and in this opinion he believed that he was supported by all his colleagues in the Asylums Board's service. To render the patient free from infection, the means which were most likely to secure the disappearance of the infecting agent in scarlet fever were, in addition to those which would bring about the cure of any morbid condition of the naso-pharynx, those which were adapted to promote an improvement in the general health and surroundings of the patient.

Dr. Victor Delsaux (Brussels) also contributed a report, and the subject was discussed by many members of the combined Sections. Whilst some entered into details about the relative merits of douching, syringing, or spraying the nasal cavities, with a view of preventing aural complications, the majority concerned themselves with the question of an early operation upon the mastoid antrum when suppurative diseases of the ear had supervened. It was maintained that if that were done more frequently the large number of patients that presented themselves in after-life for treatment at the special hospitals for the diseases of the ear, nose, and throat, and also in the special departments of the general hospitals, would be considerably diminished.

Dr. Goodall, in his reply, after touching upon the impossibility of removing ropy mucus from the nasal cavities by means of a spray, dealt with the question of early operative treatment for otitis media in scarlet fever. Formerly he did operate early, but often found nothing in the antrum; he had therefore given up this treatment. In support of the treatment he had described, he had given exact statistical information, but the otologists had not given the same in support of their contention that scarlet fever left lasting ear disease through a mastoid operation not being performed.

The following resolution was put to the meeting from the chair and carried:

> It is the opinion of the members of the Sections of Otology and of Rhinology and Laryngology of the Seventeenth International Congress of Medicine, London, 1913, that it would be greatly to the advantage of the community if experts in otology, rhinology, and laryngology were attached to special hospitals for the treatment of epidemic diseases.

SALVARSAN AND OTHER ARSENICAL COMPOUNDS IN DISEASES OF THE THROAT, NOSE, AND EAR.

THE Sections of Rhinology and Laryngology and of Otology met together on August 8th, under the chairmanship of the President of the first-named Section, Sir StClair Thomson, for the discussion of the methods and results of treatment of diseases of the throat, nose, and ear by salvarsan and other arsenical compounds.

The discussion was opened by Dr. André Castex (Paris), who said that salvarsan and neo-salvarsan were often useless, and occasionally harmful, to the ear, for they seemed to fix syphilitic poison in the nervous system. Where mercury had been employed in similar cases it had shown itself to be the more efficacious. On the other hand, salvarsan was useful in syphilitic affections of the nose, the pharynx, and the larynx. Atoxyl left the patient liable to neuritis and hectine was of little utility. His

general conclusion was to the effect that the employment of these arsenical products was of moderate importance in oto-rhino-laryngology.

Professor Gerber said that the arsenical compounds played a part of the first importance in the treatment of spirochaetal diseases of the nose, throat, and ear. In the case of atoxyl the "neurotropic" effect was too severe in comparison with the "spirochaetotropic." Only with salvarsan and neo-salvarsan was the relation of these two effects, thanks to the brilliant work of Ehrlich, so far reversed that the great therapeutic powers which lie hidden in arsenic could be made of service. These substances possessed a specific activity found in no other bodies, and produced no ill effects except in the organ of hearing; the auditory nerve, on account of its great susceptibility, should receive special attention under arsenical treatment.

Mr. H. Whale (London) summarized the results obtained in some cases he had treated. Professor Alexander (Vienna) said there was a greater tendency to labyrinthine trouble after the use of salvarsan than after quicksilver in the treatment of syphilis of the ear. Unfortunately the good results when obtained were not permanent, and it was very important to have a knowledge of the contra-indications of the use of salvarsan in the treatment of the ear. Dr. Maurice (Paris) and Dr. A. de Stella (Ghent) followed.

Dr. Lieven (Aix-la-Chapelle) said that repeated and combined treatment must be insisted upon. Spasmodic injections of salvarsan were of no avail. If the patient was opposed to repeated and persistent treatment, then it were better to adhere to the old treatment of mercury and potassium iodide. Dr. Marschik (Vienna) recited a case successfully treated. Professor Segura (Buenos Aires) quoted a case in which a man had contracted syphilis and had given it to his wife; the salvarsan behaved differently in the two cases, curing one and leaving the other in a condition which nothing would cure.

Professor Brühl (Berlin) said that salvarsan did good in recent cases of labyrinthitis, but not in chronic cases, and that salvarsan was to be considered efficacious in syphilitic affections of the ear generally, but in labyrinthitis it was not so satisfactory.

Sir Robert Woods (Dublin) said that with salvarsan results could now be obtained which were not obtainable before.

Professor Finder (Berlin) mentioned the case of a middle-aged man, the subject of malignant syphilis, in which salvarsan was given; relapses followed and a subglottic swelling occurred necessitating tracheotomy.

Dr. Dundas Grant (London) considered that tracheotomy should be postponed in cases of syphilitic disease of the larynx causing stenosis until after a dose of salvarsan had been tried. Recently there had come under his observation cases in which there was marked necrosis and ulceration after several injections of salvarsan had been given.

Dr. Dan Mackenzie had been gratified with the results obtained by salvarsan in cases of throat and nose disease. He had not used it at all for the ear, and was not likely to do so after what had been said, but he looked upon it as a reliable remedy in syphilis of the upper air passages.

Dr. Koenig (Paris) mentioned a case in which the patient had become completely deaf after salvarsan.

The openers replied, Professor Gerber adding that in labyrinthitis, when other things had failed, salvarsan might be of service, and there was no harm in trying it.

HEALTH OF CHILDREN BETWEEN INFANCY AND SCHOOL AGE.

ON Monday the Section of Hygiene and Preventive Medicine held a joint session with the Section of Stomatology, and the subject for discussion—the supervision of the health of children from 1 to 5 years—produced an animated debate. While all the speakers were in complete accord as to the importance of this epoch of child life, hitherto comparatively neglected, there was a marked divergence of opinion on one or two points. The dental surgeons, regarding the matter in the light of their speciality, unhesitatingly condemned the use of sugar by children, while the physicians, as a rule, took the view that sugar was not only harmless but indispensable, and that when Nature implanted the love of this substance in children she knew what she was about. There was also an interchange of courtesies between the two professions as to the ignorance by doctors of dentistry, and vice versâ, but a pretty general consensus of opinion that doctors should be educated in dental anatomy and therapeutics, and that dentists should know something about general medicine.

The discussion was opened by Dr. W. Leslie Mackenzie (Medical Member, Local Government Board, Scotland), who showed how comparatively unprovided for in this country by medical inspection was the period of child life under consideration, though in France about a quarter of the whole population between the ages of 2 and 6 was provided for in *Ecoles maternelles*, public and private. It was generally conceded that the ordinary school was not the place, nor the ordinary school curriculum a suitable curriculum, for children aged from 3 to 5. Therefore, if education was to begin at all, or to be effectively prepared for before the age of 5, as seemed desirable, it was necessary to devise other educational institutions. Foremost in this connexion he would place the so-called nursery school, where young children could be placed by their parents at this tender age without the risks of infection connected with attendance at the ordinary school and away from the dangers of the streets. One method of covering at least part of the field would be a correlation of the work of medical inspection of school children on the one hand with a search for the sequels of infectious diseases on the other. The speaker also made special reference to the excellent work done by Dr. Forsyth at the Westminster medical inspection centre for children under school age.

Dr. Robert Dinet (Paris) having given details of the methods adopted in France, Mr. W. W. James (London) dealt with the question from the point of view of the dentist, pointing out the importance of distortions and irregularities of the teeth, and tracing the various evil results which might follow from neglected dental caries, such as loss of function of the teeth, impaired mastication, consequent impaired digestion, infection of other parts of the body, such as otitis media, with its train of evil consequences, enlarged and inflamed lymphatic glands. Objection was often made to the removal of temporary teeth, but in his opinion this course was frequently imperative in order to obviate the train of symptoms referred to.

Dr. David Forsyth gave details of the work done at the Medical Inspection Centre in Golden Square, which had been most encouraging. The Notification of Births Act had been made use of to get in touch with the babies, and by the same means they also got hold of older children at the same time in their homes. The commonest defects found were decayed teeth, tonsils and adenoids, and rickets. The utility of the work was limited by the fact that it was entirely voluntary, and they had no means of compulsion. It was often hard to get hold of the mothers, especially the careless or ignorant ones, and the most important step required was education of the mothers.

Dr. Cruet (Paris) recommended a diffusion of stomatological ideas among doctors, nurses, mothers, and all instructors of children. It was most important that doctors should be educated in dentistry and dentists in medicine, and that the two professions should work together in harmony.

Dr. Kerr expressed himself as strongly in favour of nursery schools. He thought children were too much classed according to their ages, and that it would be far preferable for teachers to determine for each child a kind of physical and mental index. The most important diseases that might be prevented by medical inspection of children before school age were Pott's disease, otitis media, and deafness, with its consequence deaf-mutism, and eye diseases and errors of refraction.

Mr. Colyer (Surgeon, Royal Dental Hospital) laid down three propositions: (1) That the seeds of dental disease suffered from in after-life were sown between the ages of 3 and 5; (2) that the results which followed dental teaching were marvellous; and (3) that the earlier treatment of the teeth was begun the better. It was absolutely clear to him that the State must take over the care of those children between infancy and school age, and he strongly advocated the institution of a Ministry of Public Health.

Mrs. Leslie Mackenzie described the "toothbrush drill" which had been instituted in Edinburgh, by which means

the children were now educating their parents. Dr. H. L. Keith Shaw (Albany, U.S.A.) hoped that the old fetish of "teething" as a diagnosis of most disorders of childhood would soon be relegated to the limbo of forgotten things. He thought that dental prophylaxis in young children was not sufficiently appreciated by dentists, and laid special stress on the phenomenon of the "nervous child" as a product of modern civilization. Mr. Sim Wallace (London) advocated a school for doctors to teach them dentistry. The hygiene of the mouth was not taught in books on physiology, which were responsible for disseminating most erroneous ideas on that subject. He strongly deprecated the use of sugar by children, and stated that the physiological action of sugar was to cause a flow of saliva, by means of which the deleterious action of the sugar could be as quickly as possible removed. Professor Maggiori (Milan) recommended the use of the cinematograph, as practised in America, for teaching children about the hygiene of the mouth. Dr. W. S. Arkle (London) was strongly in favour of nursery schools, provided the element of teaching was eliminated from them, and that the children were allowed to play when they wanted to, and sleep or rest when they wanted. Mr. J. G. Turner (London) objected to all sticky substances as food for young children. He advocated the use of dry bread, made of coarse meal, but not standard bread. Mr. Sim Wallace had said that he could not clean the teeth with a toothbrush, but he (Mr. Turner) was able to clean the surface of each tooth most effectively by the simple means of tilting the toothbrush.

Dr. Woods Hutchinson (New York) did not believe in all the "faddism" about food. He thought the three chief requirements of food were that it should taste good, give a sense of resistance in mastication, and a comfortable feeling inside when it got down. He would let a child have what it wanted and when it wanted it, and would give him plenty of sugar and also butter, and he would give the teeth plenty to do. Dr. Smith (Lynn, Massachusetts, U.S.A.) condemned the "toothbrush drill," as he believed much damage was done to the teeth by excessive brushing. He also condemned the use of tooth powders and washes. He had found good results from the use of thyroid preparations in retarded dentition.

ANATOMY AND EMBRYOLOGY.

DISCUSSION ON THE MORPHOLOGY OF THE SYMPATHETIC SYSTEM.

Professor Carl Huber (Michigan), who presented the report on this subject, said that the sympathetic system was to be regarded as a unit which maintained throughout the whole vertebrate kingdom its essential morphological feature—the presence of the synaptic basket, a structure which he found was better displayed by means of the methylene blue stain than by the more recently introduced silver stain. Although, however, the system was to be regarded as a unit, different portions subserved different functions, for in mammalia no less than nine different types of sympathetic neurones could be identified, and this difference in structure naturally implied a difference in function. An interesting statement which he made concerned the nervus terminalis in the rabbit, a nerve which he believed to be a sympathetic nerve. He was able by the use of a differential stain to distinguish it from the olfactory nerve fibres, since the latter stained light brown while the former stained black. He felt quite sure that the peripheral portion of this nerve was truly sympathetic, although he admitted some doubt regarding its central portion. He regarded the nervus terminalis as the sympathetic appanage of the first primary cerebral vesicle.

Professor Paterson (Liverpool) regarded the sympathetic system as the original nervous system, and considered that the cerebro-spinal system had been superadded. He thought the sympathetic system was primarily for the innervation of the alimentary canal, and the glands developed from it.

Dr. J. F. Gaskell (Cambridge) was of opinion that no account of the sympathetic system could be considered satisfactory that ignored the adrenal chromaffin tissue, which should be regarded as part and parcel of the system. It was no mere coincidence that the action of adrenalin was the same as that of stimulation of the sympathetic nerves. The regulation of the cardio-vascular system was brought about by the adrenals and by the sympathetic nerves. The sympathetic system was to be regarded as intimately and primarily connected with the vascular system. In lower forms it lay in close relation to the vessels, and owing to its distribution along the segmental vessels was itself to some extent segmental. In the Cyclostomata, chromaffin cells disposed along the vessels replaced the sympathetic system of higher types. In Amphioxus there was no contractile vascular system and no chromaffin system, the inference being that one system does not exist without the other. The cells of the sympathetic ganglia and the medullary cells of the adrenals had originated in the same manner—namely, by emigration from the central nervous system.

Professor Wilson (Sydney) thought the separation of sympathetic and cerebro-spinal systems was not in keeping with morphology, and suggested that a better division of the nervous system would be into medullary and sensory ganglionic.

Professor Ariëns Kappers (Amsterdam) closely questioned Professor Huber as to the reasons why he considered the nervus terminalis sympathetic in the rabbit.

DISCUSSION ON THE MORPHOLOGY OF THE SHOULDER GIRDLE.

The proceedings on Monday, August 11th, were opened by a report from Professor Anthony (Paris) on the morphology of the shoulder girdle. He set himself on the one hand to give a synthetic summary of the question as it presents itself to-day from the anatomical point of view, and, on the other hand, to place in evidence the factors which may have determined in the course of phylogeny the principal modifications of general aspect which the elements of this girdle present in the batrachians, reptiles, birds, and mammals. He regarded the pectoral girdle as consisting of certain fundamental elements and other superadded elements of membranous origin. The fundamental elements first appeared in the form of a cartilaginous arc divided on each side by the limb into a dorsal and ventral portion, the latter being again divided into an anterior and posterior portion, the procoracoid and the coracoid. The ventral portions underwent great regression, reaching its maximum in mammalia; this regression was to be associated with the development of the clavicular arc. It was here, however, pointed out that in certain fossil reptiles the procoracoid remained well developed, whereas the coracoid suffered regression. The union of the procoracoid and coracoid in the mid-ventral line was identical in nature with that in which the costal arches take part where the costal sternum exists. The elements of membranous origin arose in order to fix more firmly the region in front of the thoracic girdle in consequence of the requirements of terrestrial locomotion. The clavicle formed for this purpose gradually replaced the procoracoid. An episternum of similar origin was superadded in those cases in which the sternum was lacking in solidity. The gulo-sternal system of the Stegocephalia was distinguished from the episterno-clavicular system of other vertebrates by its dermic origin, but Professor Anthony thought it possible that the episterno-clavicular system might have originated from a pre-existent system of ossified dermal plates.

Professor Bryce (Glasgow) dealt with the histogenesis and phylogenetic history of the clavicle. He homologized the extension of ossification from membrane along cartilage in the clavicle with the ossification around Meckel's cartilage in the case of the mandible. He regarded the cartilage which appeared in the clavicular region as a portion of the primordial cartilaginous skeleton like Meckel's and not as an adventitious portion like the cartilage deposits out of which the coronoid and condyloid processes were formed.

Professor Thane (London) did not agree with Professor Anthony in believing that the cartilaginous portions of the clavicle could be attributed to friction or in homologizing them with sesamoid bones. He considered cartilage was a provision to enable bone to grow in length where the pressure from surrounding parts was great. He thought that there was often confusion among writers with regard to the procoracoid owing to structures of totally different origin being referred to under the same name. The so-called procoracoid was sometimes a distinct entity and took part in the formation of the glenoid cavity, at other

times it was a division of the coracoid, while in the Chelonia it was distinctly a process of the scapula. He thought the word "sternum" should be restricted to that element of the thoracic skeleton to which it was first applied, and deprecated the use of such words as "sternalization" and "pelvic sternum."

Professor Parsons (London) was of opinion that there was a looking-glass homology between the fore and hind limbs, the parts in the former being in a reversed position to that which they held in the latter. He had been led to this view by a study of the musculature of the two limbs, and to some extent by the nerve supply. If his opinion were correct the coracoid might be the representative of the pubis, and the procoracoid the representative of the ischium.

Discussion on Late Prehistoric Man in Britain.

Professor Parsons (London) described in considerable detail the features of what he termed River-Drift Man. The chief characteristics were a long oval cranium and a relatively low stature. In sharp contrast with this type he described the features of Bronze Age Man, who had a short round cranium and possessed a considerably higher stature. Professor Parsons quoted instances to show that even to-day these two types were the types most frequently met with among living Englishmen.

Professor Wright (London), drew attention to the remains recovered from a large series of barrows on the Yorkshire wolds. The people whose remains were there found lived at the beginning of the Bronze Age, about 1000 B.C., and judged from the customs and culture formed a homogeneous community. An examination of their skulls, however, showed that they were of a very mixed type. Very long skulls and very short skulls were at times obtained from the same barrow. In other respects than that of mere contour the skulls showed a marked similarity. Professor Wright believed that this mixture of types had taken place on the Continent, and thought that most probably these people had entered Yorkshire from the region of the Baltic.

Professor Reid (Aberdeen), described a number of very short skulls which had been obtained from cists in Aberdeenshire. It was a matter of great interest that these skulls in that part of Scotland were closely associated with the ceramic known as the drinking-cup.

Professor Bryce (Glasgow) found, as a result of his researches in the cairns and barrows of the West of Scotland, that in the earlier cairns the skulls were of a long type, while in the later cists he found the round-headed type. It would thus appear that whereas in Yorkshire the two types were found mixed, in Scotland they were distinct. He differed from Professor Wright as to the origin of the round-headed people and thought that they were traceable to Central Europe. Of the two types the long-headed variety formed the majority in the population of Scotland to-day.

The Piltdown Skull.

In the afternoon the Section met in the Natural History Museum in order to see the famous Piltdown skull and hear a demonstration upon it from Dr. Smith Woodward. Whatever might be thought of the reconstruction of the skull, there could be no doubt, he considered, that the peculiar features of the lower jaw justified him in regarding the skull as that of a new genus. Later in the afternoon the Section met at the Royal College of Surgeons to examine Professor Keith's reconstruction of the same skull and to hear his criticism of Dr. Smith Woodward's specimen. The chief points upon which Professor Keith laid emphasis were the size of the cranium and the character of the dentition. He contended that the cranial capacity was almost half as large again as that estimated by Dr. Smith Woodward, and by reference to the muscles of mastication he showed that the dentition was more human than simian. Other speakers agreed entirely with Professor Keith, who must be congratulated on having so early and skillfully corrected the impression which had been conveyed by the first monograph on the subject. Professor Elliot Smith said that he was not surprised to find a large brain in conjunction with a jaw which in the region of the symphysis was distinctly simian. He had long maintained that the reduction and humanization of the face and jaws had been effected subsequently to the full growth of the human brain.

A Prehistoric Sudanese Race.

Dr. Derry (London) contributed a paper on some physical characters of a prehistoric Sudanese race. The remains of this race were found at Gebel Moya, in the province of Sennar. The majority of the burials showed that the body had been buried in the extended posture. The stature of these people was unusually high, recalling the tall Sudanese races of the present day. The skulls were very rugged and heavily built. The face was unusually long, although this was partially masked by the width, depth, and prominence of the malar bones, which formed a most characteristic feature. The faces had a general negroid appearance, and were distinctly prognathous. The mandibles had short, blunt coronoid processes, except in one instance, in which, curiously enough, this process rose to an enormous height. Mutilation of the teeth had been practised after a manner still in vogue among several Sudanese tribes.

Independent Papers.

Cyto-architecture of the Brain Stem.

Dr. Mussen (München) contributed some new observations on the pulvinar of the *Macacus rhesus*. The particular question considered was whether the *noyau lateral dorsal* belonged to the *noyau lateral* or to the pulvinar. Diapositives illustrating the structure of the thalamus in the frontal and sagittal planes of Dr. Clarke were shown, demonstrating the association of this region with the pulvinar, showing how it formed the anterior superior region of this nucleus, and also the effect of this new addition to the pulvinar on the boundaries between the pulvinar and the thalamus proper.

The Mitochondria in Nerve Cells.

Dr. Shirokogoroff (Dorpat) reported the results of his examination of the nerve cells of the central nervous system in a number of mammals with a view to demonstrating mitochondria. Very precise instructions were given as to the method of fixation of the cells, some of the fixation fluid being injected during life, and also as to the method of staining. An examination had been made of the cells in different parts of the brain and cord in the rabbit, dog, and cat. The mitochondria were best seen in the ganglion cells of the medulla of the cord and in the Purkinje cells of the cerebellum. In the cells of the cortex of the cerebral hemisphere the mitochondria were very few in number. The length of the mitochondria differed in different animals—they were larger in the rabbit than in the dog and cat. The axis cylinders of the nerve fibres also contained mitochondria, but only very sparsely.

Development of Brain and Eye.

Dr. Albert Wilson (London) gave a demonstration on the development of the brain and eye, showing sections through these parts in an embryo of thirty-eight days and another of eight weeks. He showed also sections through the cortex at the fourth, fifth, and sixth months. He also by sections contrasted the appearance of the prefrontal cortex in a normal adult, in a child of 5 years, in a degenerate, and in a girl suffering from congenital syphilis.

Development of the Central Nuclei of the Cerebellum.

Dr. Addison (Philadelphia) read a paper on the development of the central nuclei of the cerebellum from their earliest appearance. The material used was from the albino rat taken during the period extending from the seventeenth day of intrauterine life until the thirtieth day after birth. The changes in the shape, size, and arrangement of the cells and the time relations of the development of the Nissl substance and of the medullation of the fibre tracts connected with the nuclei were especially studied. A discussion was raised by Professor Ariëns Kappers as to the distinction histologically between the palaeo- and neo-cerebellum. No distinction had been found by Dr. Addison with regard to these parts in the rat, a fact which was possibly due to the rapidity with which in this animal development occurred; in consequence such embryological differences as could be noted in man in regard to the period of persistence of the outer

granular layer and the date at which the myelin sheath was provided were not readily distinguishable.

The Correlation of Isotherms with Variations in the Nasal Index.

The President (Professor Arthur Thomson), in a paper on this subject, stated that the nasal fossae must be regarded as part of the respiratory tract and subject to modifications with the rest of the tract. By drawing isothermal lines across the Continent of America, and comparing the nasal indices of living races and of skulls from the regions of the different isotherms, he found that whereas at the equator the nostrils were wide, on proceeding from the equator in either a northern or southern direction the nostrils were found to be narrow, to protect the delicate nasal mucous membrane from large draughts of cold air.

Cerebral Localization and the Significance of Sulci.

The last meeting of the Section took place on Tuesday, August 12th, and was perhaps the most important of all, for it was rendered noteworthy by two brilliant papers contributed by Professor Ariëns Kappers (Amsterdam). The first was on cerebral localization and the precise significance of sulci. The author gave a complete historical and literary review of this very large subject, discussing the various theories which have been advanced to explain the presence of sulci—the vascular theory, the cranial theory, and the more modern theory that their existence is to be associated with intrinsic qualities in the brain itself. He showed how it is in the thin regions of the cortex, regions associated with sensory functions, where sulci most largely abound. In the relatively thick layer of the cortex associated with motor functions sulci rarely occurred, and even when they did, were confined to the borders of these areas. He also showed that the presence of sulci bore a close relation to the size of the brain, the smaller the brain the less the number of sulci, the reason being that in large brains the cortex, owing to its thinness, had to enlarge still more in surface area than the growing and expanding underlying parts, if it were to keep pace with them, and this it could do only by throwing itself into folds. His conclusion was that nearly all the principal facts revealed by fissuration—several of which were found long before the intrinsic studies were completed, and were consequently absolutely uninfluenced thereby—have been confirmed by the latter; the involution of the insular region in carnivora, the presence of an uncovered insular part in anthropoids, the phylogenetic enlargement of the frontal lobe, the fact that this enlargement is specially due to the pre-Sylvian field of that lobe, the value of the anthropoid variation of the fissura centralis for the evolution of this fissure in human anatomy, the backward displacement of the occipital (visual) area under the influence of an augmentation in the post-parietal region, the possible transition of the anterior supra-Sylvian gyrus in Heschl's gyri, the relative constancy of the superior temporal convolution, the additions that take place in the lateral and mesial occipito-temporal region—all these facts deduced from fissural studies were confirmed in principle by the studies of the intrinsic characteristics of the cortex made during the last decades.

Professor Elliot Smith (Manchester) expressed himself as being in entire agreement with Professor Ariëns Kappers. He regretted that for purposes of discussion there were no representatives of the rival "Brodmann" school. He thought that from Professor Brodmann's own facts support could be obtained for Professor Kappers's thesis. He dealt in detail with the fissuration in the occipital region, with the splenial and calcarine fissures, and showed how these were associated with the fibres of the optic radiations.

Professor Anthony (Paris) discussed the fissuration in the region of the insula and on the orbital surface of the frontal lobe, leading up to the same conclusion.

Neurobiotaxis.

Professor Kappers also contributed a paper on the phenomena of neurobiotaxis in the central nervous system, in which he maintained the thesis that the course of fibre tracts in the nervous system afforded sufficient evidence that their arrangement was influenced if not determined by associative stimuli. In other words—that there was a neurobiotaxis in the direction of the stimuli, the cells following the path of the dendrites. He disbelieved the theory that the site of cells in the central nervous system was determined by mechanical influences. He brought forward in support of his view much evidence from lower vertebrata, paying particular attention to the fifth, seventh, and ninth cranial nerves.

Professor Elliot Smith was of the opinion that the cells moved not so much spontaneously but because of the pushing to which they were subjected by the development of new tissue between them.

Short Papers.

Professor Anderson (Galway) read a paper on the skeletal elements of the extremities in primates. He brought forward a number of measurements to show how the size of bones was affected by the pressure or weight to which they were subjected.

Dr. Villemin (Paris) drew attention to a fold of mucous membrane situated at the duodeno-jejunal junction. Into the fold penetrated certain muscular fibres from the circular muscular coat of the gut. The fold had in its submucous tissue Brunner's glands on its duodenal side, but these glands were not present on its jejunal side. It also bore a definite relation to a strong slip of the suspensory muscle of Treitz.

Concluding Ceremony.

The President then brought the proceedings of the Section to an end. He thought that both from the high interest of the subjects discussed as well as from the eminence of the authorities who had taken part in them, the meetings had been eminently useful and suggestive. He paid a warm tribute to the valued services of Dr. Macphail, the Secretary of the Section, and to Dr. Wood-Jones, the reporter of the Section. A vote of thanks to the President and officers was proposed by Professor Thane and supported by Professors Waldeyer and Huntingdon and carried with acclamation.

The Museum.

The museum of the Section well represented the varied activities of British and Continental anatomists. Reconstruction models of human and animal embryos seemed to have first claim on their interest and attention. A stereotaxic instrument invented by Dr. R. H. Clarke for the localization of the central nuclei of the brain seemed to fulfil successfully the purpose for which it was designed. In the adjacent department on museum technique special mention should be made of the beautiful specimens shown by Professor Spalteholz (Leipzig) and Professor Wahby (Cairo).

Social Engagements.

In addition to the general social functions of the Congress, the President held a reception at the Holborn Restaurant on Thursday evening, August 7th, and there was a sectional dinner in the Great Hall of St. Bartholomew's Hospital on Friday evening, August 8th. About fifty members of the Section attended the dinner. The toast of "The Section" was proposed by the President and replied to by Professor Waldeyer (Germany), Professor Romiti (Italy), Professor Anthony (France), Professor Huntingdon (America), Dr. Shirokogoroff (Russia), Professor Éternod (Switzerland), and Professor Ariëns Kappers (Holland).

PHYSIOLOGY.

Reciprocal Innervation.

On Monday, August 11th, the forenoon sitting of Section II was devoted to a discussion on reciprocal innervation.

The discussion was opened by Professor Sherrington (Liverpool), who pointed out in the first place that if heightened activity were reflexly evolved in one organ or set of organs it was accompanied by a corresponding depression of activity in another organ or in a set of organs, and that this twofold result was well exemplified in the musculature. Thus, if a pair of suitable muscles were tested experimentally it was found that a reflex stimulus which caused one to

contract caused the other to relax simultaneously with the contraction of the former. A pair of muscles or of muscle groups which thus reacted reciprocally to one and the same nerve stimulus were said to show a reciprocal innervation. He showed that there were two classes of this innervation—(*a*) peripheral and (*b*) central. As an example of the first type, the musculature of the intestine, with its lowly organized local nervous system, afforded, perhaps, the best example. Other examples of this peripheral type were found in the antagonism of the muscles of the arthropod claw and in the case of the cervical sympathetic and the iris muscle. The skeletal muscles provided the examples of the central type. They contrasted strikingly with the visceral and circulatory muscles in that they were dependent altogether on the activity of the central nervous system. The motor centre was the only source whence impulses could reach it. The inhibition of the skeletal muscle was always reflex. The motor centre was a convergence point for various reflex influences competing, so to say, for dominance over the muscle. He then discussed the importance of this reciprocal innervation in the execution of movement. He pointed out that in the anatomical arrangement of the musculature individual muscles are frequently so placed as to exert their pull in diametrically opposed directions. A most striking example of this fact was given by the hinge joints, such as the elbow and the knee, where the extensors and flexors exert their pull in exactly opposite directions. Experiment had shown that in reflex flexion of the joint the afferent nerve evoked at one and the same time a reflex contraction of the flexor muscle and a reflex relaxation of the extensor. A less simple kind of antagonism was found to occur where double joint muscles were involved—muscles which acted directly on two joints. He found that the reciprocal innervation also held good in rhythmic and alternating reflexes, with their more or less rapid reversals of phase and direction—as, for example, in the stepping reflex, the scratch reflex of the hind limb, and in consensual nystagmus of the eyeball. Reciprocal innervation was also found to extend beyond cases of pure mechanical antagonism. The reflex relation which existed between the two knee extensors right and left was reciprocal—that is, the same stimulus which excited reflex contraction of the one evoked reflex inhibition of the other. Here, of course, the two muscles could not be held to be antagonistic in the true sense of the word, as they neither operate on the same lever nor even on the same limb. A very similar state of affairs existed in the muscles of the eyeballs. Also in the maintenance of tonus and posture reciprocal innervation played an all-important part. He then discussed double reciprocal innervation. He pointed out that any particular motor centre, whether for flexion or extension, lay under at least a twofold influence, tending on the one hand toward excitation and on the other toward inhibition. He finally showed that double reciprocal innervation played a very important rôle in reference to the rhythmic reflexes. Rhythmic contraction of the muscle resulted when the intensities of the inhibitory and excitatory influences acting in one and the same centre were fairly closely equipoised, with the result that the discharge from the centre was of a rhythmic nature. This rhythmic reflex action resulting from the exercise of double reciprocal innervation occurred not only in symmetrical pairs of muscles but also in antagonistic pairs. He believed that the basis of explanation of the rhythmic result might lie in the fact that excitation as it proceeded tended to favour inhibition as its after-result, and conversely inhibition favoured response to subsequent excitation.

Professor Verworn (Bonn), who followed, dealt chiefly with the fundamental nature of the process of inhibition which played a part in reciprocal innervation. He gave a summary of his well-known views regarding this process. He believed that the simplest reflex arc in the cord consisted always of three neurones.

Professor Bayliss (London) discussed reciprocal innervation from the aspect of the vasomotor reflexes. In this case the nerve supply was more complicated as both dilator and constructor fibres were present. He then detailed experiments which he had carried out after the use of strychnine and of chloroform.

Dr. Graham Brown (Liverpool) dealt with the relation of the parts necessary for the reciprocal innervation of the antagonistic centres. He raised the question of the nature of the fundamental activity of the centres. He came to the conclusion that that fundamental activity was now represented by the rhythmic activity, and that the spinal reflex was a later interference with this activity, and was of the nature of a distorted beat.

Professor Fröhlich (Bonn) discussed particularly the nature of the rhythmic reflexes, and Professor Meltzer (New York) dealt for the most part with the historical aspects of the question.

Dr. Bárány (Vienna) spoke of the course of the neurofibrils in the ganglia in connexion particularly with conduction. Dr. Hofmann also spoke.

Professor Sir E. A. Schäfer thought that, in the primitive reflex arc there were only two neurons involved, although undoubtedly ultimate change might take place with the utilization of three neurons. The axon reflex was the most primitive of all. He believed that this simple reflex played a most important part in many physiological and pathological processes.

Laboratory Meetings.

On Friday, August 8th, the morning session of this Section was devoted to a joint meeting with the Section of Medicine for a discussion on the correlation of organs of internal secretion and their disturbances (see p. 374). In the afternoon the Section met for demonstrations in the Physiological Laboratory at University College (Professor Starling).

Enzymes.

A paper on the synthetic action of enzymes was read by Professor Bayliss (London), who, as the result of his experiments reached several general conclusions. As he found that, in a simple system, the action of an enzyme, emulsin, was found to follow the laws of catalysis by a single agent, the conclusion seemed to him justified that, whenever apparent deviations from such laws were met with, instead of inventing new enzymes or making assertions as to the non-application of the laws of physical chemistry to enzyme action, an endeavour should be made to find the reasons for the divergence. Further, he thought that until the impossibility of finding such reasons had been demonstrated, it was more in accordance with scientific method to hold provisionally the application to all enzymes of the laws which could be shown to apply to so many. He did not think that the term "enzyme" or ferment should be applied to any substance not manifesting the properties of a catalyst.

The Galactagogue Hormone.

Sir Edward Schäfer gave a demonstration on the effects of hormones on milk secretion. He stated that the galactagogue hormone in blood was far from constant. He found that the injection of the extract of the posterior lobe of the pituitary body caused a flow of milk, and this he demonstrated in a most striking manner.

Other Demonstrations.

Other excellent demonstrations were given by Professor Starling (London) on the factors determining the coronary circulation, and by Dr. C. Lovatt Evans (London) on the respiratory changes of the isolated lung. Professor Bainbridge (Newcastle) showed some experiments on the frog's kidney, and Dr. Patterson (London) discussed the antagonism of adrenalin and carbon dioxide. Dr. A. H. Rutherford (Sydney) gave a short communication on the ileo-caecal valve.

The afternoon session of the Section on Monday was held in Professor Halliburton's laboratory at King's College, and was mainly for demonstrations.

Dr. Korentschewsky (St. Petersburg) gave a communication on the correlation of the action of the thyroid and testicle and ovary on metabolism. He found that castration of animals after thyroidectomy did not influence the metabolism so markedly as when performed on normal animals. Professor Langlois (Paris) read a paper on the production of apnoea as the result of the injection of adrenalin.

Interesting demonstrations, were given by Professor Brodie (Toronto), Dr. Locke (London), Professor Halliburton (London), and Professor MacWilliam (Aberdeen).

GENERAL PATHOLOGY AND PATHOLOGICAL ANATOMY.

DISCUSSION ON THE PATHOLOGY OF SHOCK.

THIS discussion was opened by Professor YANDELL HENDERSON, and it was to be regretted that Dr. Crile did not join in the opening debate as was expected, for, as Henderson pointed out, their views were in many respects divergent, Crile considering that certain structural changes in the cortical cells are the fundamental element, whilst Henderson regards these as degeneratives resulting from the anaemia involved in shock. Professor Henderson said that shock was not a clear-cut disorder, but a group of conditions of superficially similar appearance. The older surgeons, and even John Hunter, regarded concussion as shock; they held that vibrations were transmitted throughout the body, which led to a depression of function. He instanced the various kinds of shock which have been described, such as electrical shock, anaphylactic shock, and emotional shock following grief or fright, in which death might occur from fibrillation of the heart. As to death under chloroform, Levy and Cushny had shown that animals sometimes died suddenly under slight anaesthesia; mention was made also of cases of sudden death after a few seconds' immersion in water. In recent years shock has been regarded as a state of profound general functional depression, rather than as a mode of death. There were varieties of this "state," for to the gynaecologist it was the result of haemorrhage, to the general surgeon in dealing with accident cases it meant depression of vital functions usually following intense suffering, like that following haemorrhage, though there have been none; to other surgeons it is the state of depression following prolonged and extensive operations often without either haemorrhage or suffering; to the physiologist, who had to perform prolonged operations on animals, a similar state presented itself; and to those who experimented on animals with a divided spinal cord there appears "spinal shock." These conditions were not identical, and he divided them into "haemorrhagic shock," which included also surgical shock and a toxaemia state closely allied in appearance, and "spinal shock." He held that syncope, instanced by Goetz's *Klopversuch* experiment, resembled spinal shock, though shock was not syncope. He next discussed cases of death from respiratory failure after prolonged pain or other excitement, and explained the fatal apnoea on the acapnia theory, which supposed that breathing ceased for lack of enough CO_2 in the blood to excite the respiratory centre. The CO_2, which was the normal stimulant of respiration, was reduced by the excessive hyperpnoea accompanying great pain. Experimentally he had confirmed this by reducing the CO_2 in animals by excessive artificial respiration and producing death. He held, also, that Crile's experiments agreed with his own, in that most of the experimental animals died of respiratory failure. He touched on some interesting experiments on the tonic influence of CO_2 on the unstriped muscle of the intestines, and the fact that tympanites could be prevented or relieved—experimentally at any rate—by restoring the CO_2 content of the blood or tissues. He next dealt with failure of the circulation in shock, and held that acapnia again formed one causal condition of this. He distinguished between arterial pressure and venous pressure, and mentioned some unpublished experiments in which the latter had been determined (in the jugular or femoral vein); in spinal shock the arterial pressure fell enormously, but venous pressure was unaffected for a long time, whereas in experimental haemorrhage the venous pressure fell progressively. He held, therefore, that in haemorrhagic shock it was the veno-pressor mechanism which failed, but this was not a matter of contractility of the veins, but concerned the volume of blood in the body and the conditions controlling it. Hence circulatory shock was comparable with exsanguination, and he concluded that the solution of the problem did not concern the sterile question of the vasomotor centre but rather the factors controlling the blood volume. Shock was not vasomotor failure; its fundamental conditions were not nervous but chemical.

Mr. Malcolm (London) contributed some important clinical studies bearing on the subject. He had seen many cases of all degrees of surgical shock when the peritoneal cavity was exposed, but he had never seen any sign of the congestion of the splanchnic area which, as a student, he was taught to regard as characteristic of shock. On the contrary, as shock developed the peritoneum became as pale as the skin in which there was certainly no congestion. For this and other reasons he adopted the view that the vessels became more and more contracted as the state of shock became more marked. When the theory that the vessels were dilated and the vasomotor centres paralysed was published it seemed altogether opposed to the facts. This view was founded upon the observation that the blood pressure fell very low in the state of shock. Mr. Malcolm maintained that this was not an indication of muscular relaxation when the conditions were otherwise the same and the influence of gravity was eliminated. A fluid flowing through a small tube had always a lower pressure than a fluid flowing through a larger tube, and although the conditions were very complicated this law must hold good in the blood vessels. If the arteries were contracted, the amount of blood in them would necessarily be diminished, and it was certain that in some way or other the whole amount of fluid in the vascular system was diminished in the state of shock, and thus was the chief cause of the fall of blood pressure. He welcomed the teaching of Yandell Henderson as offering an explanation of many clinical facts; amongst others, it accounted for the state, clinically indistinguishable from that of shock, which was sometimes caused by the administration of an anaesthetic before the surgeon touched the patient. Yandell Henderson's views also seemed to suggest that the condition of sustained high blood pressure, discussed more particularly by physicians, might be due rather to an interference with the normal distribution of fluids than to a contraction of the arteries. Discussing the view of Tyrrell Gray, who unfortunately was not present, he said that this ignored entirely the important question of the loss of fluid from the body.

Dr. Brodie (Toronto) agreed with Henderson in that the vessels were not dilated, but insisted that "experimental shock was not the same as surgical shock."

Professor Morton pointed out that primary respiratory failure did not occur after injury, but failure of circulation.

Dr. Ivy McKenzie recalled Sir William Macewen's teaching that respiratory failure was the danger signal for the anaesthetist. This supported Henderson's views.

Dr. Wesley Mills, speaking from a long experience of changing views, suggested that all the theories up to date had proved too narrow, and advised workers to be always weighing them in the balance with their facts. His own personal experience had taught him that no pain or feelings he had ever experienced were as bad as surgical shock.

Professor Henderson, in his reply, dwelt on the fatal folly of treating shock by venesection. He narrated his experiences whilst living on Pike's Peak (14,000 ft. high) for six weeks with Professor Haldane, and emphasized the view that chemical differences in the blood gases influence the blood volume, and anticipated that with increased knowledge of colloids and changes in the body it would be possible to solve the question. Meanwhile therapeutics must be directed to keeping up the supply of water. Finally, he said no single formula would include all the conditions, but facts must be accumulated with an open mind.

DISCUSSION ON THE EFFECT OF RADIO-ACTIVE SUBSTANCES AND RADIATIONS UPON NORMAL AND PATHOLOGICAL TISSUES.

This important discussion was to have been opened by Professor Oscar Hertwig, but owing to his absence, which was much regretted, his co-reporter Dr. Lazarus-Barlow read the first paper. But Hertwig's paper had already been circulated, and as it formed a valuable adjunct to the discussion we append an abstract.

Dr. W. S. Lazarus-Barlow (London) said that in spite of the relatively short time during which the substances and radiations under discussion had been known, the literature was enormous, though much of it was vitiated by insufficient information concerning the conditions under which the *x* rays, radium, etc., had been used. From this literature, and particularly from the medical side thereof, one fact was clear, namely, that injurious effects might

follow upon great exposure to irradiation. The effects upon skin, hair, and nails were examples of this statement as well as O. Hertwig's observations upon the effect of radium rays upon the ova of frogs, which was so profound that he spoke of the production of "radium disease." In order to study these conditions more closely simpler chemical combinations, whether organic or inorganic, had been investigated and it had been shown that the rays exerted profound effects. Thus H_2O and NH_3 had both been broken up into and synthesized from their elements, while leucocytes, red blood corpuscles, opsonin, complement, starch, nucleo-protein and several of the enzymes had been shown to be changed to a greater or less extent by the radiations. In all these instances the change had been in the direction of degradation (dextrin being produced from starch, for example,) and it was agreed that the alpha rays were the most powerful in producing any change that occurred. What effects, if any, were produced by beta and gamma rays, and whether gamma rays (when an effect was produced) acted directly or by virtue of soft secondary beta rays to which they gave rise, were matters of doubt. In the previous instances effects of irradiation were destructive or inhibitory, and large doses of rays were given; the author and his pupils had investigated small quantities of radium (around the order of 10^{-7} mg. Ra) since the author had found small quantities of the element in cancerous tissue, etc. His researches had shown that the mean quantity of radio-active substance in a variety of normal tissues was 1×10^{-9} mg. per 100 grams of tissue, a quantity on the verge of detectability by the special method for determining small amounts of radium (emanation electroscope). On the other hand, in the non-malignant tissues of cancerous individuals the mean quantity found was 23×10^{-9} mg., and in actual cancerous tissue the mean was not less than 51×10^{-9} mg. Special interest attached to estimations of gall stones taken from non-cancerous and cancerous cases, dividing the latter into (*a*) cancer generally, excluding cancer of the gall bladder; and (*b*) cancer of the gall bladder. Whereas the mean amount of the radium (as element) in gall stones from non-malignant cases was 1×10^{-9} mg., and in cancer cases, excluding cancer of the gall bladder, was 5.7×10^{-9} mg., the gall stones found in cancer of the gall bladder gave a mean of 84×10^{-9} mg. Ra. Moreover, it was not unusual to find gall stones from non-malignant cases or cancer, excluding gall bladder cancer, entirely free from radio-active matter, whereas in no single instance had the gall stones from cancer of the gall bladder failed to give evidence of a relatively considerable amount. The author had examined the effect of quantities of radium of the order of magnitude under consideration upon the development of the ova of *Ascaris megalocephala*, and had found clear proof that in these quantities radium stimulated the division of cells. Using larger quantities and the muscle-nerve preparation of the frog he had equally found stimulation, for under alpha radiation from 7 mg. radium bromide the muscle-nerve lived longer and contracted with a smaller stimulus than the control. He refrained from theorizing, but insisted that the evidence he had brought forward was so suggestive that further research on similar lines was necessary.

Professor Oscar Hertwig (Berlin), in his paper, said that the discovery of radio-active substances had not only produced a revolution in the chemico-physical theories, but had also led to extraordinary discoveries in the department of biology and to new methods of investigation. It had been ascertained that preparations of radium and mesothorium were of great importance in influencing vital processes in plants and animals. The theory at first held that lecithin was the body acted on had been given up, and the microscope had shown that it was the nucleus substance that reacted to the rays. In experiments on *Rana fusca* it was found that if the spermatozoa were acted on by small doses of rays, though they did not show any perceptible alteration in structure, yet when they impregnated the ova caused an alteration in the development of the ova so as to produce "radium-larvae." This effect was produced by the rays acting on the nuclear substance of the head of the sperm cell, since the chromatin in the nucleus had the power of growing and multiplying in the ovum in the course of the karyokinesis. To show this, as opposed to the lecithin theory, the experiment had been made of applying the rays to the mature ovum before impregnating it with normal spermatozoon. The alteration in the development has been no greater than in the other case. If the lecithin theory were correct, the equal effect of acting on the enormously greater mass of the ovum would be quite inexplicable. If it were accepted that the effect was produced on the nuclei alone there would be no great difference between the mixture of a tainted male nucleus with a normal female one, or vice versa. The apparently paradoxical effect of acting on the male element with a maximal dose was that the development after impregnation was much more nearly normal; all the parts and organs were produced, though reduced in size. This was explained as a form of parthenogenesis. The nucleus of the spermatozoon had become inactive, but the entrance into the ovum was the stimulus for commencement of development; and instead of the resulting parts being a mixture of a healthy and an unhealthy element they consisted of a single healthy normal element. This mode of growth kept on more successfully than the abnormal mixture, the male nucleus taking no part in it, and, indeed, being extruded. Further extremely interesting experiments were quoted bearing out this theory. Many experiments on different tissues showed that while full grown and differentiated cells and tissues were comparatively little affected, on the contrary, embryonic cells and others which in adults lingered in an undifferentiated state, especially generative cells, young nerve cells, leucocytes, and tumour cells in a state of growth, were especially sensitive. Blood and lymph of man and the haematopoietic organs connected with them were especially altered by radio-active bodies. Microscopically a great diminution of the number of white corpuscles was observed, caused, on the one hand, by wholesale disintegration, and, on the other, by diminution in replenishment. In the treatment of leukaemia by Roentgen and radium rays, while temporary improvement had taken place, no enduring cure had been reached. The introduction of solutions of radium and mesothorium, either subcutaneously or intravenously, had been followed by great reduction in the leucocytes, amounting almost to a leucopenia, and enlargement of the spleen and lymphatic glands had diminished.

Professor Warthin contributed some clinico-pathological studies on the effects of Roentgen rays on leukaemic tissues examined *post mortem*. He had found a marked destructive action on the tissues, especially on the lymphocytes and myelocytes; in fact the entire lymph node might be killed by the treatment. In some the lymph nodes and spleen decreased in size, and the abnormal cells disappeared, but in the bone marrow a leukaemic condition resulted. In one exception a leukaemic condition developed. He concluded that this line of treatment offered a prolongation of life of one to two years, but all the cases died suddenly.

Dr. Mottram, in experiments with radium emanations on growing plants and ova of ascaris, had found that: (1) Beta and gamma rays produced a disturbance of normal growth in both animal and vegetable tissues. (2) This was more marked if the rays were applied during the period of active division, which in the case of plants occurred at night. (3) The dividing ova of ascaris were eight times more vulnerable than the resting ova. (4) Exposure was followed by profound nuclear changes affecting the ova, the nuclei of which showed fragmentation of the chromatin. He concluded that satisfactory treatment of new growths could be expected if the cells were rapidly dividing and there was excess of karyokinetic figures.

Dr. Bashford expressed an entire ignorance of the subject of radium, and was a little sceptical as to the discovery of radio-active bodies in tissues and tumours, but he criticized favourably the "brilliant" work of Hertwig.

Dr. Hektoen then read a paper on Altmann's granules, and pointed out the effect of radium rays on their existence.

Dr. Russ (London) related some of the results of the conjoint work by himself as physicist, and Miss Helen Chambers as pathologist. They had found a wide difference in susceptibility of tumours to rays. They had exposed tissues to rays for varying periods, and then inoculated them into mice, and, according to the duration of exposure, they had obtained no growth or a slower growth in the infected animals. Furthermore, the characteristic of slow growth assumed by these irradiated

tumours had been transmitted to successive generations, confirming the work of the French school. All these facts were illustrated by charts and instructive diagrams.

Dr. Gnezda mentioned some effects of phosphorus on tumours, and Professor Adami pointed out that Bardin of Wisconsin had experimented with *x* rays on spermatozoa seven years ago. He held that a death-blow had been given to Ribbert's theory that cancer depended entirely on the cell and not on the surrounding tissues.

Dr. Lazarus-Barlow, in replying, urged Dr. Bashford to cultivate a knowledge of radium, and pointed out that in answer to the destructive criticisms of his earlier work on skotography he had now replaced all these experiments by the present ones. He concluded by expressing the opinion that radium treatment was a "possible" treatment of cancer, but only when used in sufficient strength to kill the cancer cells and stimulate the connective tissue cells.

"Cancer" in Plants.

An interesting account of "cancer" in plants was given by Dr. Erwin Smith, Director of the Laboratory of Plant Pathology in the Bureau of Plant Industry of the Department of Agriculture, Washington. Dr. Smith also filled a large section of the museum with his collection of specimens, charts, and publications on this subject. He demonstrated these tumours as masses of tissue hyperplasia consisting of vessels, fibres, and parenchymatous cells in varying amount, so that two types occurred—namely, the hard fibrous and soft fleshy. Secondary infection and necrosis occurred early. The growths might be found on any part of the plant, and according to the position affected the structure of the root, stem, or leaf. There was no actual overgrowth of any one type of cell, but rather a hyperplasia of the entire part of the plant concerned, so that the growth was symbolic, though in most cases it got the upper hand and the plant succumbed. Secondary growths occurred, but these were not truly analogous to cancerous metastases inasmuch as they always spread by contiguity, but in this connexion the fact that there was no circulatory system in plants was recalled. Etiological investigation had revealed a bacterial parasite which inhabited the soil and occurred in the growths as an intracellular parasite. Dr. Smith had cultivated this organism, which was shown to be pleomorphic; by inoculating into any part of the plant he could produce a tumour-like hyperplasia which resembled the tissue of the part infected. Excision of the growth was only followed by reappearance if any part had been left behind. Other points were touched upon concerning the rate of growth, the age of the host, and the effects of nutrition.

This contribution excited much discussion, and it was generally held that, though the parasitic tumours were not strictly analogous to cancer, they were of great import in investigating the question of new growths. One striking difference was the fact that the growths did not exhibit any marked overgrowth of one type of cell, but showed a proliferation of an entire tissue, so that the striking feature of malignant tumour was missing—namely, the inharmonious growth of a special cell.

Primary Tissue Lesions in the Heart Produced by Spirochaeta Pallida.

Professor S. H. Warthin (Ann Arbor) observed that, according to textbooks, syphilitic lesions of the heart were very rare. Certainly gummata of the heart were rare; but other lesions, he held, were common, and this he supported by the result of his past four years' work, aided by the increased knowledge of the *S. pallida*. He exhibited many lantern slides to support his view that this organism was readily and frequently found in the heart, and that it might lead to pure parenchymatous lesions, in which they occurred in incredible numbers. These lesions, which were sometimes of a peculiar oedematous condition, might lead to dilatation. Similar findings were frequent in congenital syphilities even up to 21 years of age. Certainly his slides showed well-stained spirochaetes.

Mr. Shattock said that many years ago, and long prior to the discovery of *Spirochaeta pallida*, he had drawn attention to the oedematous lesions associated with syphilis.

Dissecting Aneurysm.

Dr. J. Sherman gave a lantern demonstration to illustrate his paper on the etiology of dissecting aneurysms. These he arranged in two groups: (1) Those associated with atheromatous patches, which ruptured and allowed blood to enter the vessel wall, and (2) those occurring in the absence of atheroma; the latter, he held, depended mainly upon the existence of pathological changes in the media. He then discussed the question of rupture of the aneurysm back into the lumen of the vessel, and concluded by demonstrating that miliary aneurysms of the brain were true dissecting aneurysms. This latter point met with agreement from Mr. Shattock, who commented on the absence of naked eye changes in these cerebral aneurysms, which, however, showed changes in the middle coat.

Calcified Arteries.

Professor Adami next read a paper by Dr. MacCordrick of Montreal on the rigidity of calcified arteries, which aroused much interest from the novelty of the observation and the important bearing it must have on the study of arterial disease if corroborated by other workers. Dr. MacCordrick contended that arteries as a general rule were not of a stony rigidity during life, and in fact the calcareous matter was not present in the form of rigid plates, but in a form which might be compared to unset mortar. He supported his arguments with illustrations from the operating theatre and the *post-mortem* room, and especially from one case which had been examined one hour after death. Also he had experimented with mixed mortar and mixtures of calcium oxide and calcium phosphate in various acid and alkali media and with CO_2—this on account of the fact that the tissues and body fluids during life were alkaline, but became acid shortly after death, at which time also CO_2 accumulated in the arteries. He concluded that in arteries provided with an adequate circulation the calcareous matter—in the intima or media—remained unset. Hence the explanation of the absence of injury after handling "pipe-stem" radials, and also the absence of thrombosis on the calcified plates found at autopsy. Ulcers and plaques were, indeed, *post-mortem* changes.

Mr. Shattock and Dr. Andrewes discussed these points, but so new an observation must be more carefully and widely investigated.

CHEMICAL PATHOLOGY.

The President, Dr. Gowland Hopkins, in his opening address on Thursday, August 7th, welcomed the members of the Section, and stated that the occasion was an important one, because it not only inaugurated the meetings of the Subsection of Chemical Pathology in this particular Congress, but was also the first occasion on which any such Section had ever met. The separation of the Sub-section from that of General Pathology was a recognition of the importance of the subjects to be discussed by it, and the ever-increasing necessity for the thorough understanding of the chemical aspects of pathological problems. In the last few years a great change had come over the knowledge considered necessary for attacking these problems, and it was now no longer considered sufficient that investigators should have a thorough knowledge of chemistry only—it was becoming more and more evident that experience in the clinical and pathological sides of the problems was absolutely necessary.

Discussion on Pathological Conditions Due to Defects of Diet.

Dr. Schaumann (Hamburg), in opening the discussion, pointed out that recent discoveries had revolutionized the former conception of nutrition in man and animals. A sufficient amount of the main nutritive substances—namely, albumins, carbohydrates, fats, salts, and water—were not alone sufficient, but certain other substances, normally present in the most minute quantities in food, were essential. The number of such substances was probably large, and at present only a few of them had been considered. Certain cyclic amino-acids fell within this group, and vitamine had been isolated recently in crystalline form. It was, however, in all probability only one of many such substances, which accumulated in relatively large amounts in certain animal and vegetable materials, such as yeasts, the pericarp of rice, barley, wheat, etc., bull testicles, the brain, the heart, and the eggs of mammals and birds. The substances probably did not

exist in a free state in foodstuffs, except in a small proportion of cases, but were constituents of more complicated molecules, such as nucleins and phosphatides. Their influence appeared to be specific for each, and their absence to give rise to a more or less typical disease, for example, beri-beri, scurvy, Möller-Barlow's disease, and pellagra. They were labile, being destroyed by long storage, by long treating and cooking, by alkalis and micro organisms, and being removed by husking and polishing, extraction by salt, lye, etc. The methods for the preparation and isolation of this class of compounds were still very imperfect. On this account the attempts to isolate them in a pure state had not been very satisfactory. For the same reason it was difficult to make sure whether these compounds were contained originally in the foodstuffs in a free state, or combined with other substances. In consequence it was at present impossible to come to a definite conclusion, whether the efficiency of the compounds belonging to this class and containing phosphorus was, or was not, in part due to the phosphorized group of the whole molecule or not. A number of observations led either to this interpretation or to the conclusion that the metabolism of phosphorus was especially favoured by one or several of the compounds in question.

The President, continuing the discussion, said that Dr. Schaumann had so amply described the present state of knowledge of the subject that he would confine himself to that more physiological part of it with which he was the most familiar, and discuss the question as to whether the normal growth of a young animal called for factors in its dietary of which, until very recently, the science of nutrition had taken no account. This question had a direct bearing on disease, inasmuch as it was almost certain that if the absence of these constituents of the food caused arrest of normal growth, they would also cause actual diseases of nutrition. His own experiments had been performed almost entirely on rats; many hundreds of animals, always with controls, had been used, so that experience had been gained in the behaviour of these animals in all conditions of nutrition. On a diet of an artificial mixture of pure proteins, fats, carbohydrates and salts, young rats within a period of about fifteen days ceased to grow. A minute addition of certain tissue extracts and fractions of such extracts was sufficient to secure normal growth. Of the nature of these substances he could at present say little, neither the vitamine of Funk nor the oryzanin of Suzuki showing themselves capable of maintaining growth for any appreciable time. The greatest success he had at present obtained was with crude phosphotungstic acid precipitations, but the more these precipitates were washed the less active substance remained. The substances did not seem to be basic in character, or of the nature of lipoids; they were slightly soluble in alcohol, insoluble in ether; they were resistant to heat and to the effects of keeping, but tended to disappear during chemical manipulations. With respect to the minute additions, which had converted an inefficient into an efficient diet, he dealt with the criticisms of Abderhalden and Lampé, to the effect that the experimental work on beri-beri was to be explained on a quantitative deficiency of known dietetic factors, such as proteins or phosphatides. The additions, he said, had been free from amino-acids, purin and pyrimidin bases, and choline certainly could not produce the result. The question of the salt content was a different matter, for, an artificial salt mixture was certainly not as efficient as the ash of mixed foodstuffs, and faint traces of fluorine or manganese and the like might be present in food ash and necessary for the animal. In his researches the substitution of an artificial salt mixture had always caused a remarkable condition of conjunctivitis allied to keratomalacia. The question was, however, certainly not one of salts alone, as the substances added in these experiments were entirely salt-free. The presence of minute traces of certain organic substances at present unknown was without doubt essential for proper nutrition.

The next speaker, Dr. Funk (London), referred to the production of neuritis in pigeons,[1] and stated that the isolation of the crude vitamine fraction of foodstuffs was now a matter of no difficulty. The vitamine fraction was very complex, and probably consisted of three separate substances.

[1] British Medical Journal, April 10th, 1913, p. 814.

Professor Ivar Bang (Lund) stated that personally he did not believe in specific substances. These investigations were only in their infancy, and needed much more work.

Professor Benjamin Moore said that the rapid recovery seen when these necessary substances were given was almost the most specific experiment in medicine. The ill effects of the diet of skim milk and bread, adulterated by bleaching and other processes, on which the children of the poor were fed, might be explained on the lines of the present discussion.

Professor Barger deprecated the giving out of uncertain complicated chemical formulae for such substances as were being discussed.

After Dr. Sigmund Fränkel and Dr. Alexander Haig had also spoken, Dr. Schaumann replied. Commenting on the President's address, he said that rats were the most difficult animals of all to work with, as results came so slowly; large numbers of experiments were necessary for the investigation of these problems.

Discussion on the Application of Pathological Chemistry to Clinical Problems.

A general review of those applications at present valuable was given by Dr. Garrod, but the discussion was mainly concerned with the problems of metabolism, and especially with the result of blood examinations.

Professor Otto Folin (Boston) confined himself to his own metabolism work, and laid special emphasis on the great importance not only of the most accurate technique, but also familiarity with the degree of accuracy which could be attained by it. The very best methods in unskilled hands might yield wild results. Skill and experience were just as important in chemical work as in surgical operations. Clinicians could not have sufficient time to acquire this. The bulk of metabolism work reported in clinical journals was consequently grossly unreliable. He then referred to the chemical examination of the urine and the blood, and said that while examination of the urine had brought to light some facts as to the nature of disease, very much more was to be hoped for from the examination of the blood. For in disease while waste products might be eliminated in practically normal amount, there might nevertheless be serious accumulations within the body. The primitive notion of impure blood had a kernel of truth in it. In gout, for example, it was very difficult to show that the uric acid excretion in the urine was other than normal, and if it had not been for the fact that uric acid was so easily found in joints, the definite relation between uric acid and gout would have been very hard to establish. On the other hand, the discovery of the abnormal elimination of ammonia in acidosis was a brilliant contribution to clinical medicine. The formation of urea was probably merely a method of preventing the accumulation of ammonia in the blood, and had nothing immediately to do with protein metabolism. The millions of urea determinations which had been made by clinicians might therefore just as well have been omitted. Creatin and creatinin excretion was becoming of increased importance, though their significance was at present not satisfactorily worked out, but in all probability they had to do with tissue metabolism as opposed to food metabolism. Creatinin in the urine of adults was practically independent of food protein, and depended on the size of the person. Scarcely a trace of creatin was present in the case of normal adults, but considerable amounts might be excreted in disease; the urine of children, on the other hand, normally contained creatin. The blood of normal human adults contained from 22 to 30 mg. of non-protein nitrogen per 100 grams of blood. About one-half was represented by urea, the remainder by amino-acids and various soluble materials as well as traces of uric acid, creatin, creatinin, and a barely perceptible trace of ammonia. In nephritics, syphilitics, and the insane these nitrogenous waste products in the blood were greatly above the normal. Such determination could now be made with 5 c.cm. of blood only. It had also been possible to show that by a suitable diet—for instance, in nephritis—these products could be reduced to a level at which the kidney could adequately deal with them, so that they were kept within normal levels in the blood. Uric acid in the blood could also now be

accurately estimated; it varied in the normal between 1 and 2 mg. per 100 grams. It was an interesting fact that there was no correspondence between uric acid and non-protein nitrogen in the blood. In gout, lead poisoning, and leukaemia the uric acid content was high, yet non-protein nitrogen might be absolutely normal. Atophan given to a gouty patient greatly decreased uric acid in the blood, appearing to stimulate the kidney to greater activity, it also caused an increased elimination of non-protein nitrogenous products. Such blood analysis in conjunction with urine analysis must lead to results of the greatest clinical importance.

Dr. Garrod began by emphasizing the fact that all scientific treatment must be based on anatomical, physiological and chemical knowledge of the conditions of health and disease. Chemical pathology was from this standpoint a subject of ever-increasing importance, to which the clinician already owed a great deal, for not only was chemical research profoundly altering knowledge of the human organism and its vital processes, but also, by studying the metabolic derangement to which it gave rise, an insight could be gained into the nature of the disturbing agent. The latest researches into the nature of an adequate diet were of the greatest direct importance to the clinician, tending to show that a sufficient calorie-value and nitrogen content was not alone sufficient to maintain nutrition; infinitesimal quantities of certain other substances were also necessary. The metabolic effects of the products of internal secretion were obviously of the greatest importance in disease. The estimation of the protein substances in the urine was of the greatest importance, and the modern discoveries that certain proteins, such as haemoglobin and the Bence-Jones protein, were excreted through the intact kidney had shown that these substances indicated tissue disintegration and placed no discredit upon the kidneys. The estimation of sugar in the urine in diabetes was obviously of the greatest clinical importance, as was also the separation of laevulosuria and pentosuria from this condition. The modern application of the chemical discovery of the variability of sugar tolerance in many diseases, as well as diabetes, was of great value. The diagnosis of diseases of the pancreas was clinically very difficult, and the chemical establishment of the presence of steatorrhoea and other chemical evidence was of great importance here also. The new methods of blood analysis promised much in the direction, for instance, of the proper understanding and treatment of gout, and should render it possible to exclude a number of ailments of later life which were at present incorrectly attributed to the gouty category. The still newer tests of Abderhalden for pregnancy and malignant disease promised to open up a still wider field of direct clinical importance. The proper use of such knowledge could only be attained by the closest co-operation between the clinician in the ward and the chemist in the laboratory. The ideal hospital would have at its command a large staff of expert pathological chemists, who would devote all their time to metabolism work. Chemical pathology was the pathology of the living, and the motto of the old Pathological Society of London, "Nec silet mors," was out of date.

The discussion that followed was rather discursive and dealt with many different points. For instance, Professor Ivar Bang (Lund) emphasized the importance in some cases of recognizing psychical glycosuria.

Professor Embden (Frankfort) drew attention to the intimate relation of an increase of sugar in the blood to increased muscle breakdown and therefore to increased heat production.

Professor Walker Hall (Bristol) questioned the value of the examination of the blood from the basilic vein alone, as this might not represent a fair sample of blood as a whole.

Dr. Kristeller (Berlin) referred to increase of creatin excretion in cases of dystrophia musculorum.

Dr. Hartley (London) questioned the presence of aceto-acetic acid in the liver, and pointed out that the reactions usually relied on were also given by acetonedicarboxylic acid.

Drs. Mackenzie Wallis (London), Robert Bass (Prague), and Professor Franz Fischler (Heidelberg) also spoke.

Dr. Garrod, in reply, stated that he had tried atophan in acute gout, but had been driven back to the use of colchicum.

DISCUSSION ON THE CHEMICAL PATHOLOGY OF THE ALIMENTARY TRACT.

Professor Barger (London), in introducing the discussion, dealt very comprehensively with the present exact chemical knowledge of the putrefactive bases in the intestine, to which, under the classification of intestinal toxaemias, so many varied symptoms were attributed. He also dealt fully with their physiological effects, and endeavoured to estimate their probable pathological significance. The best and longest known of these substances, cadaverin and putrescin, were derivatives of leucin, and were physiologically inert; they therefore were of no importance with regard to the present discussion. Another group, however, of which the chemical knowledge was exact in many instances, as the substances had been synthesized, had a marked physiological activity. This group comprised cyclic amino-acids, which were derived from phenyl-alanin, tyrosin, tryptophane, and histidin respectively. One of these in particular, β-iminazolylethylamine, commonly referred to as β-I, was a derivative of histidin which had been synthesized, and had great physiological activity. With regard to experimental results with these substances, a great difference had been found between their administration by the mouth and intravenously; by the mouth they often had very little effect, in many cases only causing a temporary diarrhoea. Many poisonous bases were destroyed in the liver, and Ewins and Laidlaw had shown that this was brought about by a dissemination process; the lack of result when given by the mouth might have been in part due to this destruction. Harvey, on the other hand, had produced arterio-sclerosis in rabbits by feeding for a long time with small quantities of tyramine, a base derived from tyrosin.

Heyde had shown that in animals suffering from burns certain of these bases appeared in the urine, and Koch had got similar results by removing the parathyroids. The pathological significance of all this was at present not clear. It had been shown that organisms were present in the intestine which were capable of forming bases from histidin, and of converting amino-acids to amines. The conditions necessary for this transformation were such that it could only take place in alkaline solution; obvious putrefaction, such as the formation of indol and skatol, did not necessarily occur in conjunction with the formation of these bases. Their physiological activity was not by any means of the same nature, some having the properties of adrenalin in causing rise of blood pressure, while others were strongly depressor to the vasomotor system. He had been able to obtain from Gruyère cheese a base which gave a marked rise of blood pressure.

The other opener of the discussion, Professor Cohnheim (Heidelberg), having been prevented through illness from coming at the last minute, his paper was read by Professor Embden. In a comprehensive survey of the subject he emphasized the difficulty of chemical investigations of the alimentary canal, as the experimenter was always dealing, not only with the secretion into any particular part, but also with the altered foodstuffs which were in addition always present. The stomach secretion had been investigated most fully, and here Pawlow's methods had been of great importance, as they allowed unmixed secretion to be collected. The total amount of this secretion could be estimated in experimental animals by a duodenal fistula. The question had been raised with regard to the technique of test-meal examinations, which was the only method adaptable to the conditions in the human patient, as to whether test meals became properly mixed with the gastric juices; in his experience this was not a practical objection. The estimation of the total acidity by phenolphthalein titration, and the free hydrochloric acid with Günzburg's reagent were both reliable. Estimations of pepsin were of no value, as hydrochloric acid and pepsin, as far as they knew, were always parallel. In pathological conditions, clinical methods had previously shown that in gastric catarrh a reduction of acidity usually was present; that with a gastric ulcer an increase of hydrochloric acid and total acidity was present, while in carcinoma either condition might occur. He had been able experimentally to show that conditions in the small intestine had considerable influence on the nature of the secretion in the stomach, and the rate of emptying of that organ. The introduction of sodium chloride into

the small intestine diminished the motility of the stomach, and the amount of gastric secretion and acidity of gastric contents; magnesium sulphate also diminished the motility, but greatly increased secretion and acidity of content. The gastric conditions were, therefore, considerably influenced by the nature of the content of the small intestine. The removal of this influence of the small intestine on the stomach by novocain caused an abnormally rapid emptying of the organ, the small content remaining being extremely acid and rich in free hydrochloric acid. This condition was very similar to that found in neurotic patients, and was not to be confused with the hyperacidity of gastric ulcer. The investigation of the other secretions into the intestinal canal was at present not often possible; the reflux of intestinal contents into the stomach, however, occasionally occurred, and gave some insight into them, but they knew little of the pathological significance of the changes of these various secretions. The investigation of the large intestine was somewhat more feasible through the examination of the faeces; but the most important conclusions that could be drawn by such examinations had reference rather to the lack of action of certain ferments; for instance, raw connective tissue was only digested by pepsin, and not by trypsin; the gastric secretion was therefore at fault when this was present. It must, however, be borne in mind that such lack of digestion might be due to extremely rapid intestinal passage. The solution of such difficulties offered a wide field for the experimental pathologist.

Professor Schryver (London), who followed, disagreed with Professor Cohnheim's statement that the estimation of pepsin in the gastric juice was unnecessary. He had himself observed cases in which the hydrochloric acid secretion was normal, but pepsin was absent. This was probably due to peptolytic ferment which occurred in alcoholic cases with severe dilatation of the stomach.

Professor Otto Folin (Boston) called attention to the fact that the symptoms of intoxication observed in dogs with Eck's fistula were not due to ammonia, but to toxic bases such as those described by Professor Barger. By exclusive carbohydrate diets, putrefaction in the intestine could be completely eliminated.

Dr. Ryffel (London) referred to the work of Lane on intestinal stasis, and stated that cultures from the small intestine taken at Lane's operations showed the presence of bacteria capable of converting histidin to beta-iminazolylethylamine, to which the symptoms of low blood pressure, general malnutrition, skin pigmentation might be due. Cultures of control cases did not show these bacteria.

Dr. Kenneth Goadby referred to certain cases with diarrhoea and low blood pressure, temporary enlargement of the liver, and oedema of the external genital organs, which suggested the absorption of this depressor base.

Independent Papers.

Intracellular Ferments and Metabolism.

Dr. Laqueur (Groningen) discussed the close parallelism between, and possible identity of, the processes of *post-mortem* autolysis and intravital protein metabolism. The three factors, oxygen, carbon dioxide, and hydrogen-ion concentration, regulated both intravital protein breakdown and *post-mortem* autolysis in a very similar manner. In both processes the gases, oxygen and carbon dioxide, were specific in producing respectively a decrease and increase in the rate of breakdown. In the discussion that followed it was generally agreed that amongst those who had worked on the subject the identity of the two processes was accepted.

Blood Ferments.

Dr. Pincussohn (Berlin) gave an epitome of some extremely interesting researches on ferments of the blood. The blood serum of an animal, he said, hydrolyzed peptones from its own protein, but not those from other animals, unless very nearly allied—such as the dog and fox. These ferments broke down the peptones of disintegrated cells which were always passing into the blood. Foreign proteins, on the other hand, gave rise to a ferment which destroyed the protein itself; hence transplanted organs only grow in the same species of animal.

Test Meals.

An interesting discussion took place on the analysis of test meals. Dr. Graham (London) maintained that the only reliable guide was by chloride estimations, the ratio of free acid to inorganic salts being almost always inverted in carcinoma.

Dr. Trevan (London) maintained that the estimation of rennin was more valuable than that of pepsin as an indication of the ferment activity of the gastric secretion.

Respiration and Metabolism in Cardio-renal Patients.

Dr. Lewis (London) described observations on respiration and metabolism in cardio-renal patients, with special reference to acid intoxication. Working with Drs. Bancroft, Ryffel, and others, he had come to the conclusion that a special class of patients might be separated with respiratory symptoms of a marked character who finally died from respiratory failure without marked signs of cardiac inadequacy. The dissociation curve of the blood showed that a condition of acid intoxication undoubtedly existed, but the condition was not one of true uraemia.

Dr. Ryffel (London), who followed, gave also the results of observations on acid intoxication in uraemia. He considered the two classes of case to be similar and to depend mainly on the degree of acid intoxication.

Dr. Otto Porgez (Vienna) considered that the condition described was due to renal insufficiency. Dr. Gaskell (London) claimed to be able to fill in a gap in Dr. Lewis's description of his cases, in that the kidney lesions were characteristic, consisting in an extreme intimal thickening of the smallest arteries of the organ, a type known as "genuine Schrumpfniere" in Germany.

A paper followed by Professor Marcel Labbé and Henri Bitte, claiming that an increased excretion in the urine of amino-acids took place in severe disturbance of function of the liver, diabetes with acidosis, rapid destruction of tissue in fevers, and the like.

Sulph-haemoglobinaemia.

An interesting paper was read by Dr. Mackenzie Wallis in which he claimed to have discovered the cause of sulph-haemoglobinaemia, and to be able to cure this condition. In this disease the blood was, he said, of a dark chocolate colour, and there was marked cyanosis, especially in mucous membranes, due to the replacement of oxyhaemoglobin by sulph-haemoglobin. The disease, he maintained, was due to the presence in the throat of a nitrite-forming bacillus, which he had been able to obtain in pure culture; the nitrite formed on absorption converted oxyhaemoglobin into reduced haemoglobin, which, with the traces of sulphuretted hydrogen in the body, formed sulph-haemoglobin. The administration of a vaccine of the organism isolated brought about a complete cure.

Athreptic Immunity in Cancer.

Dr. Gelarie (Liverpool) detailed the results of experiments in tumour transplantation in mice already infected with another tumour, or pregnant. They tended to show that immunity to carcinoma was a matter of alteration of metabolism.

Creatin.

Papers followed by Dr. E. Mellanby (London), claiming that creatin excretion was diagnostic of cancer in the liver, and by Dr. R. A. Krause (Edinburgh) on the excretion of creatin in children; he found that boys stopped excreting creatin at about the age of 6 years, whereas girls continued to do so till the age of 10.

Dr. Mellanby maintained that in diseases of the liver creatin excretion was diagnostic of cancer, and that the amount was a measure of the malignancy of the growth. The test must be made prior to any operation, and pregnancy must be excluded, as also conditions of acidosis, diabetes, inanition, and infectious conditions, especially of the abdominal cavity; though in these latter cases the acetone bodies were also present, and thus differentiated the conditions. Incidentally the test was an excellent one for pregnancy.

Professor Otto Folin (Boston) said that creatin was of frequent but variable occurrence in the urine of human adults; its significance in disease was therefore doubtful.

Dr. Mackenzie Wallis (London) confirmed Dr. Mellanby's results on the whole, and stated that the amount of creatin varied with the nature of the growth.

Dr. George Graham (London) drew attention to fallacies that might arise in creatin estimations owing to the presence of aceto-acetic acid.

Gastric Carcinoma.

A paper by Dr. Charles Singer (London) followed, showing that in carcinoma of the stomach the peptic index varied according to the position of the growth, being below 10 for the lesser growth and above 10 for the pylorus.

The Pathology of Gout.

Dr. Robert Bass (Prague) said that if uric acid were injected intravenously into normal men, after two hours 10 per cent. was still left in the blood; there was therefore normally a separation of uric acid in favour of tissues. The pathological increase of this process was probably a factor in gout. Uric acid excretion showed fluctuations in the power of the kidney; a pathological kidney failure was certainly concerned in gout.

The Influence of Light on Metabolism.

Dr. Ludwig Pincussohn (Berlin) said that metabolic changes were greatly increased after exposure of animals to fluorescent colours such as eosin. Each colour gave characteristic changes, the main difference being in the excretion of purin bodies, amino-acids, ammonia, and oxalic acid. These observations might explain the influence of sunlight and climate on many diseases.

DEMONSTRATIONS.

The meeting on Tuesday afternoon was held at the Lister Institute, and consisted in various demonstrations.

Professor Folin demonstrated his new methods of analysis in blood and urine, and Professor Abderhalden demonstrated with great fullness his pregnancy test.

Other demonstrations were as follows:

Dr. Ryffel: Barcroft's apparatus for determining the dissociation curve of blood.

Dr. Hartley: A new test for aceto-acetic acid.

Dr. H. Maclean: The influence of various substances on the estimation of sugar in urine.

Drs. C. Funk and A. B. Macallum: Colour reactions of certain constituents of food.

Dr. E. C. Grey: Apparatus for collecting gases in bacterial fermentation.

Dr. Mackenzie Wallis: The blood in sulph-haemoglobinaemia.

Dr. Trevan: The clotting of milk.

Dr. Clowes: Charts demonstrating the similarity of reaction of certain physical and biological systems to electrolytes and anaesthetics.

BACTERIOLOGY AND IMMUNITY.

FILTER PASSERS.

THE nature of those minute bacteria or protozoa which have so far escaped detection by means either of the microscope or of the culture tube was the subject of an interesting discussion in the Bacteriological Section on Monday morning. Dr. C. J. Martin presided, and was extremely happy in the manner in which he conducted the business of the meeting.

Professor Loeffler (Greifswald) gave a masterly review of the knowledge gained during the past fifteen years, since he and Frosch first discovered that the virus of foot and mouth disease was so minute as to be capable of passing through a porcelain filter without losing its infectivity. Since then he had studied many of the viruses known as filter passers, of which there were thirty-eight known varieties. These included the viruses of foot and mouth disease, yellow fever, hen cholera, rabies, swine pest, molluscum contagiosum, three-day fever, cow-pox and small-pox, poliomyelitis, measles, scarlatina, typhus, rinderpest, and trachoma. The largest of these was probably the virus of the pleuropneumonia of oxen, which Nocard believed in 1898 was not filtrable. Later, however, this was shown to be a mistake. Professor Loeffler dealt with each of the varieties separately, and touched on some of the more important facts connected with their study. He dealt further with the attempts which had been made to cultivate some of these viruses artificially. He was in a position to deny the claim made by Lichery that the virus of vaccinia had been cultured. In regard to the causal germ of poliomyelitis, it appeared to be highly probable that Flexner and Noguchi had succeeded in cultivating it by the same means as they had adopted in their successful attempts to cultivate the *Spirochaeta pallida*. Siegel succeeded in cultivating extremely small roundish bodies from the blood of animals suffering from foot and mouth disease, but it had since been proved that these coccal bodies were not the causal parasites of this disease. Professor Loeffler critically reviewed several other experimental pieces of work, coming to the conclusion that the definite culture of each one was highly doubtful and certainly could not be accepted to-day. He regretted the very slow progress made in the study of these important bacteria, and pleaded for the institution of special funds to enable competent workers to follow up the investigation more energetically than had hitherto been done.

Sir John McFadyean agreed that research into the nature of filter passers should be freely subsidized. He objected somewhat to the term "filter passers." The passage of a bacterium through a filter depended on several conditions: the texture and thickness of the filter wall, the pressure under which the filtration was carried out, the duration of the filtration, the composition of the fluid in which the bacteria were suspended, and the form and dimensions of the bacteria, were all of importance in determining whether they should be included in this group. He uttered a note of warning against accepting evidence of filtrability. In the majority of cases it was quite easy to determine whether the filtrate which was free from all visible and culturable bacteria was still capable of inducing in suitable animals the symptoms of the disease of which they were causal agents, but in the case of swine fever neither the characteristic pulmonary lesions nor the marked degree of contagion followed infection with filtrate. Referring to the size of filter passers, he laid down the proposition that filtration experiments merely proved that a given virus was smaller than the test bacterium. Abbe held that filter passers were less than 1 μ in diameter, but the matter was not so simple. For example, the smallest visible microbe was probably that of pleuropneumonia, which measured about 1 μ, while the *Spirillum parvum*, which was said to be a filter passer, measured only from 0.1 to 0.3 μ in diameter and from 1 to 3 μ in length. Von Esmarch had been able to show multiplication of the last named virus in the filtrate. Having dealt with some of the attempts to cultivate these various filter passers artificially, he suggested that the reason why these attempts had in nearly every case failed might be that the organisms were protozoal in nature, and therefore in all circumstances difficult of culture.

At this stage in the discussion Dr. C. J. Martin stated that he could well understand the paternal interest and pride with which Professor Loeffler had spoken of the filter passers, but he could not agree with him in looking forward to a large increase in their number, since the difficulties in studying these micro-organisms were extremely great. He therefore invited those present to record negative as well as positive results.

Dr. Fornet (Berlin) spoke of his experiments with vaccinia, the virus of which he claimed to have cultivated. This was done by utilizing the fact that when diluted in ether instead of in glycerine the extraneous bacteria were removed but not the vaccinia virus. Starting from sterile pock lymph it was quite easy to prepare an ether lymph which proved to be extremely active in animals (rabbit, calf, and man), and which did not lose its virulence. The reason why he was convinced that the virus multiplied on being inoculated from tube to tube was that after passing it through five sets of tubes, until the original material had been diluted to 1,000 billion times, a mere trace of the fifth tube was still capable of producing marked local lesions. He could not conceive that this would occur if the material had been diluted without multiplication. It was necessary for a successful result to get rid of all extraneous bacteria.

Professor Kraus (Vienna), speaking of the virus of hen-pest, showed that variations of virulence in hens and in geese were met with, and in the instance of the rabic virus similar variations had been seen.

Dr. Lambert (Columbia University) claimed to have cultivated the vaccinia virus in the cornea of rabbits.

Professor Friedberger (Charlottenburg) gave his experi-

ence as to the resistance of the vaccinia virus towards a number of antiseptics, including ether, bile, formalin, etc.

Dr. Alan Green (Lister Institute) showed that the virus of vaccinia, if properly handled by dilution of the contents of vesicles in citrate solution, would not pass through a filter of considerable closeness. He suggested to Dr. Fornet that chloroform might prove to be a better means of ridding vaccinia from extraneous bacteria, but he expressed doubt as to the advisability of purifying vaccinia either for practical purposes or for experimental uses. He was inclined to regard Dr. Fornet's results as mere dilution results, and not as cultures.

Professor Sims Woodhead (Cambridge) also approved of the use of vaccine lymph which contained some extraneous bacteria. His experience showed that it was difficult to obtain a satisfactory vaccine after filtration.

Professor McWeeney (Dublin) raised the question whether ultra-visible viruses were not existent in nature apart from disease. It appeared to him probable that they might be found among the mirco-organisms connected with such processes as putrefaction.

Dr. Bousfield mentioned that on his suggestion the Metropolitan Asylums Board had recently appointed a bacteriologist to investigate the causal organisms of such diseases as measles and scarlatina, and this he described as a subsidizing of research into the filter passers.

Dr. C. J. Martin detailed the experiments of Todd, who had been able to prove conclusively that the virus of rinderpest was incapable of passing through a porcelain filter. He discovered that the virus could be collected by centrifugalization; blood containing the highly infective material after having been centrifuged became inactive save in the layer of white cells.

In reply Professor Loeffler admitted that the capability of passing through a filter of certain viruses had been disproved, and experiments of Pröscher and others had given him food for thought. He was but little inclined to accept Dr. Fornet's evidence in regard to the cultivation of the vaccinia virus.

Dr. Fornet defended his position, and Sir John McFadyean wound up a highly spirited debate.

THE LEPROSY BACILLUS.

On Tuesday morning the question, Which culture of leprosy bacillus is the true Hansen bacillus? was vigorously debated in the Bacteriological Section. The discussion led to no definite conclusion. We may still ask, Which is the true "Peter"? as Dr. Charles J. Martin put it. But out of the varied and occasionally somewhat extravagant conjectures of the different speakers some few facts of importance and interest emerged. Dr. Duval (New Orleans) pointed out that Hansen discovered an acid-fast bacillus as the causal organism of leprosy in 1879, and since that time upwards of twenty varieties of this or similar organisms had been cultured, or at all events were said to have been cultured. The authors responsible for these cultures had delivered a variety of bacilli, which differed from one another in regard to the pigmentation of the cultures, the classification of the bacterium, and tinctorial properties. He inquired whether the cultures provided by Kedrowsky, Rost, Clegg, Bayon, and others could be regarded as acid-fast bacilli of the type of the Hansen bacilli. He attempted to throw light on the subject by turning his attention to Hansen's bacillus. This he had shown was incapable of dealing with the intact protein molecule; it lived an intracellular life, where it fed on the end products of tryptic digestion. When brought artificially into contact with the split products of proteins outside the animal body active proliferation took place, but a real culture could not be obtained in this manner, since it was not possible to provide a constant source of the amino-acids or other products of protein. Kedrowsky had utilized the juice of fresh placenta, but this tissue did not contain any split products. When leprous nodules were excised and the proteins partly autolysed, an initial multiplication of the rodlets took place. But not more than one or two generations could be traced in these nodules. Kedrowsky's cultures exhibited very marked pleomorphic characters, and were in all probability neither true streptothrix nor yet identical with Hansen's bacilli. The growth took place readily, whereas Hansen's bacilli did not grow in artificial culture at all. He complained that the characters which Kedrowsky's bacilli originally exhibited were not to be found in the strains after repeated cultivation, and the forms now shown were probably involution forms. Turning to Clegg's chromogenic cultures, he was satisfied that these were in no way related to Hansen's bacilli; the same remark applied to Bayon's cultures. In conclusion, he denied that any one had succeeded in cultivating the true leprosy bacillus, which he was inclined to classify among the *Schizomycetes*.

Major Rost was absent at first, and his paper was read for him. He claimed to have succeeded in cultivating the leprosy bacillus, to which he attributed the following characteristics: It grew on starch and potato-glycerine but not on pure albumin; its acid-fastness varied according to the medium employed; it showed marked pleomorphism; it stained with cold aniline dyes, and was Gram-positive; it was non-motile; it did not produce acid or gas on the majority of the sugars and did not produce indol. He had cultivated this organism on mudfish, and described the cultural characters in some detail. The second part of his paper dealt with the clinical aspect of his cases, which he treated with leproline vaccine made from five different strains. Up to July, 1911, 12 cases had been treated in this manner, with 4 cures, 1 apparent cure, 3 almost cured, 2 greatly improved, and 2 improved; 10 further cases had been treated up to July, 1912, of which 5 were greatly improved and 3 improved. In conclusion, he pointed out that in the prevention of leprosy the value of segregation and of sterilizing clothes could not be overrated. He was convinced that infection always took place by means of clothes.

A paper by Drs. H. Fraser and W. Fletcher was also read in the absence of the authors. They recorded their uniform failure to cultivate the bacillus of leprosy, and criticized the work of others who had obtained different results. They described their methods of obtaining material in their attempts to get cultures, the media which they employed, the methods of dealing with the contaminating bacteria, and the characteristics of the bacilli in the material dealt with when examined microscopically. The details of the paper were of value in the registering of the negative results.

Dr. Bayon (Robben Island, Cape Town) spoke of his experience in the leper colony, and at the Lister Institute. He demonstrated by means of a number of excellent lantern slides the results of his bacteriological and clinical observations. He showed the types of bacilli which various authors had cultivated, and stated that the bacillus which he had cultivated was highly pleomorphic, and was probably a streptothrix, belonging to the actinomyces. Turning to the clinical side of the matter, he demonstrated the improvement which followed the use of potassium iodide. In comparison with this, he was able to show a far greater improvement following the application of the vaccine made from his cultures after the fashion of Koch's tuberculin. In one case, for example, ten months had elapsed since the treatment had begun, and there was not a trace of the disease left. But he did not feel justified in claiming that this was equal to cure, since it was well known that leprosy at times remained quiescent, or even retrograded to start afresh after a number of years. He gave some clear pictures showing the differential diagnosis between leucoderma, syphilis, and leprosy, and, in conclusion, threw on the screen some pictures of the leper colony, which was apparently not so barren and sad a place as was usually supposed.

Professor Sims Woodhead asked Dr. Bayon whether when leprosy bacilli were induced to multiply in the rat, lesions usually occurred or not. He had noticed that tubercle bacilli often underwent enormous multiplication in the rat without any lesions being seen.

Dr. Bayon replied that in his experience lesions were not often met with in rats in these circumstances—perhaps in about 1 out of 20; but when tubercle bacilli were growing freely, he had observed lesions in nearly every case.

Professor Kraus related his experience of the intraperitoneal reaction with specific strains, in accordance with Pfeiffer's experiment, both with tubercle bacilli and with other acid-fast bacilli, including some of the so-called

lepra cultures. He had been able to demonstrate differences in the various cultures in this manner.

Dr. C. J. Martin was greatly struck by the confidence with which the various "leprosy *Förscher*" stated their case. This confidence was probably due to the difficulty of the problem they were attacking, and it was evident even in the entirely negative records of Drs. Fraser and Fletcher. He ventured to suggest to Dr. Duval that the majority of bacteria were incapable of dealing with the whole protein molecule, but required some of the split products for their nutrition. Dr. Bainbridge had investigated this matter, and had established the fact with pure forms of albumin. Even a minute trace of non-protein nitrogen might suffice. It was, therefore, not surprising that Kedrowsky had used placental juice, which he felt convinced was not so fresh as to be free from autolytic changes, and which also contained quite considerable quantities of non-protein nitrogen. Rost had used rotten fish for his culture medium, and he well remembered the intolerable smell which pervaded his floor at the Lister Institute when Dr. Bayon was growing his leprosy bacilli, which he interpreted as evidence of some protein decomposition. He deprecated Dr. Duval's affirmation that the cultures of other workers could not be true Hansen's bacilli because of their pleomorphism. He felt inclined to regard the case which Kedrowsky had made out as a very good one. Dr. Duval's first strain, however, did not appear to be the true Hansen, whereas what he described as his second strain seemed more likely. This view was based on the serological reaction which Duval had described. Bayon's cultures seemed to give quite specific reactions with the serum of leper patients, and sharply distinguished the bacilli from all the other forms of acid-fast bacilli. In regard to Rost's therapeutic measures, while he was not in a position to form an opinion, he had been informed by an Indian medical man of a somewhat sceptical turn that the results he had witnessed were far and away better than any spontaneous improvements he had ever observed. This need not, however, be regarded as evidence that Rost's cultures were identical with true leprosy bacilli, since, in the case of plague, better therapeutic results were obtained by an extraneous organism than by the homologous bacillus.

Major Rost amused his audience by finding fault with Bayon for exhibiting on the screen only his red colonies, as he had more recently grown white cultures of *Bacillus leprae*. He spoke of the peculiarities of these white colonies.

Dr. Bayon, in reply, agreed with the suggestion made by Kraus that the peritoneal test might be of use in differentiating the various bacilli, and concluded by an attack on Rost's work.

Professor Sims Woodhead did not regard the pigment question as material, and subsequently made the observation that at present it was not possible to decide which culture, if any, was the true *Bacillus leprae*.

Dr. Duval admitted that he knew less of the bacteriology of leprosy now than he did some four years ago. He had made several mistakes, had stated openly that he had cultivated the leprosy bacillus, and now admitted frankly that he was mistaken. The rest of his reply was a recapitulation of his objections to the conclusions of the other workers.

INDEPENDENT PAPERS.

Fluctuations in Gonococcal Immunity.

On Monday afternoon Professor Irons read a paper on the fluctuations in gonococcal immunity. He cited instances in which gonorrhoeal exacerbations recurred with extraordinary regularity. He attempted to measure these fluctuations by means of the complement deviation test and by the cutaneous reaction. As a rule, the periods of recurrence were associated with weak or negative deviation and cutaneous tests, but this was not constant. He pointed out that the variations of the results of the tests might conceivably lead to errors in diagnosis unless controlled by repetition. A short discussion followed.

The Period of "Lag" in the Growth of Bacteria.

Dr. Penfold stated that when bacteria which were growing slowly or not at all were put into a fresh sample of the same medium, they did not commence to grow at full pace at once. This "lag" had been subjected to close study. If the subcultures were made when the bacteria were growing at full pace, no latent period was observed. If, however, the growth were stopped during the period of full pace growth by the application of cold, the growth commenced at once without any "lag." Cold applied for a long period, for example, two days, was followed by a reappearance of "lag." The influence of the size of inoculation, of the age of the parent culture, and other factors was discussed, and a simple mathematical expression of the rate of growth was suggested. Dr. Penfold made the suggestion that the "lag" period was chiefly due to the synthesis of bacterial protein occurring in steps. An optimum concentration of intermediate products would be necessary as an antecedent to maximal growth. He believed that this optimum was being acquired during the "lag" period.

Heterogenetic Antibodies.

Professor Friedberger read a highly technical paper on the apparently paradoxical behaviour of heterogenetic antibodies. The basis of the communication was the observation that haemolysin formation at times took place in response to the injection of tissue and blood cells, which haemolysins were active not only to the specific antigen, but also to blood cells of widely different species. He demonstrated the peculiar behaviour of the immunizing index in some of these instances, and passed on to show that the power of absorption of haemolysin of individual organ extracts was directly proportional to their toxicity. A number of other important and astonishing facts were also brought to light.

Dr. Browning was able to confirm some of these paradoxes.

FERRO-SILICON.

On Monday Dr. Wilson Hake gave a demonstration in the Museum of the International Congress of Medicine on the toxicology of ferro-silicon, utilizing his exhibit of samples and tables illustrative of his experience on this subject. He pointed out that a serious loss of life had occurred on vessels carrying cargoes of this material, owing to the fact that certain grades of it were liable to evolve phosphoretted hydrogen gas when in contact with moist air. Ten thousand volumes of air containing as little as 2½ volumes of this gas had proved fatal when inhaled, and he was further able to show that some specimens evolved 16 cubic feet of phosphoretted hydrogen per ton. It therefore became obvious that a poisonous atmosphere might readily be attained in cabins contiguous to such cargo. The special regulations which had been adopted by the Board of Trade for the transport and storage of ferro-silicon should suffice to protect against accidents, but it was still necessary to awaken public interest, in order to compel shipowners and captains to conform to these regulations and to adopt other safeguards.

SECTION OF THERAPEUTICS.

COMPARATIVE VALUE OF CARDIAC REMEDIES.

ON Monday, August 11th, the Section was occupied in the morning in discussing the comparative value of cardiac remedies. The opening papers were provided by Professor Gottlieb (Heidelberg) and Professor Theodore Janeway (New York).

Professor Gottlieb dealt with the subject especially from the experimental side. To explain the action of digitalis and to construct a rational plan for treatment the results of different methods of investigation must be brought into play. Formerly clinical observation and animal experiments were carried on side by side, but the results were not always in agreement. The study of the action of cardiac drugs in normal animals was not always sufficient to enable us to understand their action in patients with heart disease. Recently, however, the phenomena of the action of digitalis on men had been observed by pharmacological methods; alterations of blood pressure and of rhythm had been recorded, while pharmacologists had considered more than formerly the action of small doses of the drug.

Professor Janeway dealt with the problem more from the clinical point of view. Inasmuch as it was impossible to separate the parts played in circulatory disorders by the heart and the blood vessels respectively, he extended

the subject to include certain drugs whose main effects were exercised upon the latter, such as caffeine and the nitrites. In chronic venous engorgement and stasis he had obtained good results from the Karell diet as an auxiliary to digitalis therapy. He had not himself often resorted to the intravenous use of pilocarpin, but he admitted the striking results which were often obtained in this way. In his opinion the choice of the best preparation of digitalis lay between a preparation from the standardized leaves (either in the form of a tincture, a powder, or an infusion) and digipuratum. He did not himself use or recommend the relatively large doses advocated by Cushny and Mackenzie in London. The indications for the use of digitalis had become increasingly precise through the exact study of the rhythm of the heart. Their task for the future was the elaboration of equally accurate methods applicable at the bedside for the study of other fundamental cardiac properties. He emphasized his belief, however, that no improvement in instrumental appliances could ever replace the skill and experience of a master clinician.

In the discussion which followed, Dr. Houghton, who urged the necessity for standardization of the drug, Dr. Windle, Dr. Roch, Professor Bishop, and others took part. Among the independent papers set for discussion were a paper by Professor Stewart (Cleveland) upon the vaso-constrictor action of shed blood (serum) and its possible therapeutic value; and a paper by Professor Leo (Bonn), upon the therapeutic uses of camphor. Dr. F. W. Price (London) discussed the action of digitalis on the blood pressure in man, and Dr. M. Breitmann (St. Petersburg) the benefits of massage.

Thermal Treatment.

The last meeting of the session on Tuesday, August 12th, was occupied chiefly by a discussion upon thermal treatment, its indications, limitations, and risks. The success of the meeting was somewhat imperilled by the circumstance that neither of the reporters was able to be present. Professor Landouzy (Paris), who should have opened the discussion, had been forced to read his paper on the previous day, while Professor Vinaj (Turin) was also unavoidably absent. Professor Landouzy enumerated, in his opening paper, the various Continental establishments which had acquired a reputation in the treatment of various disorders by thermotherapy. In the seventeenth century patients suffering from the various forms of arthropathy were already attracted to Bourbon-L'Archambault and to Vichy. Later syphilitics were sent to the sulphur-containing waters of Aix-la-Chapelle and Luchon. The institution of treatment by inhalation at the close of the nineteenth century attracted invalids suffering from emphysema and bronchitis to Mont Dore and Allevard. At the same time, Vichy, Carlsbad, Contrexéville, and Evian came into fashion for biliary and renal colic.

The risks of thermal treatment were of two sorts. Certain cures imposed a considerable strain upon the heart, while others were not free from the danger of lighting up a quiescent focus of infection. In general thermal treatment aimed at diminishing the perilesional congestion and stimulating the organism without re-awakening the infection.

Professor G. S. Vinaj (Turin), in the other opening paper, pointed out that there existed an indifferent point in temperature at which no important physiological reactions were produced. In his experience this indifferent temperature for water oscillated between 35° and 37° C. and for air between 20° and 22° C. Water, at a temperature of from 6° to 12° C., gave rise to a painful sensation, diminution in pulse-rate, and augmentation of the respiration, the blood pressure, and the resistance of muscles to fatigue. At 20° C. the effects were the same, but less marked. At a temperature of 40° to 45° C., water produced a strong sensation of heat and marked reactive changes, such as a sustained elevation of temperature, augmentation of pulse-rate, rapid respiration, fall in arterial tension, and diminution of the respiratory quotient. The loss of heat was 2,400 calories per diem. Professor Vinaj especially referred to the effect of cold in anaemia, in which in suitable cases a stimulating effect upon the blood-forming organs was produced. This might be measured by estimating the degree of urobilinuria. The therapeutic application of heat and cold by means of baths should not exceed the limits of 10° and 39° C.

Dr. Waterhouse (Bath), who followed, spoke shortly of the part played by psychical suggestion in the treatment. While he did not deny that such forces were at work, he believed that they played a subsidiary part. The chief credit of the cure was due to the effect of heat in controlling bacterial activity and in increasing the elimination by all channels. The factor of rest both of body and mind was important, while the reflex relaxation of all muscles, involuntary as well as voluntary, played a part in conditions of high blood pressure and in renal and biliary lithiasis.

Dr. Fortescue Fox (London) emphasized the importance of the duration of the hot application. In baths of short duration the effect was that of a powerful stimulant; in baths of longer duration the reaction to heat was apt to be evoked, a reaction to be shunned and avoided just as much as the reaction to cold was to be welcomed and encouraged. The symptoms of such a reaction were a continued want of fitness, nervous depression, languor, drowsiness, and muscular weakness, acceleration of the heart upon exertion, dilatation of vessels, low arterial pressure, and accumulation of blood in the veins. Such ill results were not infrequent when unsuitable cases were subjected to excessive heat of long duration.

The remainder of the session was occupied by separate papers. The good and bad effects of residing in high altitudes were discussed by Professor Kronecker and Dr. Heger. Among other communications, Dr. Maurice Faure read a paper upon a new treatment of contractures, for which he claimed satisfactory results.

The Value of the Work Done.

In estimating the work of the Section as a whole, it is impossible to avoid a feeling of some disappointment. The discussion of the first day upon the defences of the human body against bacterial invasion reached a high level of excellence, although the subject was perhaps not altogether within the province of therapeutics. The demonstrations provided in the Pharmacological Institute of University College upon Saturday morning were also of supreme value and excited the widest interest. The discussion upon remedies for pain and sleeplessness was notable chiefly for Professor Cushny's able summary of the subject, while the final discussion upon thermal treatment was poorly attended and evoked a response from only two speakers. On the whole it would seem that it is difficult to prevent a section devoted to therapeutics from being somewhat overshadowed by sections devoted to medicine and surgery and to their special branches. For example, the discussion opened by Professor Ehrlich upon salvarsan took place elsewhere than in the Section of Therapeutics.

MEDICINE.

Discussion on Diabetes Mellitus.

The morning session on Monday, August 11th, was occupied by a very satisfactory discussion on diabetes mellitus.

The subject was introduced by Dr. G. Dock (St. Louis), who went fully into the different views that have been published in the hope of clearing up its etiology. The connexion of diabetes with the pancreas is well known; perhaps too much attention is paid to the pancreas in diabetes and too little to the other organs of the body. The control exercised by the central nervous system on the sugar-producing functions of the liver is better recognized nowadays than it used to be; the fact that many spots in the brain besides the diabetic centre of Claude Bernard gave rise to diabetes on puncture is not sufficiently recognized. Reference was made to Cushing's admirable work on the pituitary gland; its posterior lobe plays an important if indefinite part in the metabolism of the carbohydrates, and its glycolytic function appears to be under the control of the superior cervical ganglion of the sympathetic. Acidosis, the terminal event that brings on diabetic coma in so many cases of diabetes, was connected with decrease in the amount of carbohydrate in the diet, increased fat metabolism, and increase in the formation of sugar from the proteins of the bodily tissues. In the

treatment of the disease, now mainly a matter of dieting, it was important to secure the attention and intelligent help of the patient.

Professor C. von Noorden, who followed, gave a first-rate account of the most recent views of the way in which the carbohydrate metabolism of the body is regulated. It was, he said, needless to insist on the fact that this regulation was highly complicated, and it was hard to say at what point a description of it should begin. Starting, however, with the intestine, it might be said that it pours the sugar-glucose, absorbed from the food, into the portal vein. This glucose was seized by the liver, and stored in the form of glycogen. The liver retailed this glycogen, converted once more into glucose, in accordance with the demands made upon it by the tissues. Professor von Noorden presented to his audience a diagrammatic scheme in which the control of the glycogenic function of the liver was set out. The pancreas was, he said, the organ that tended to keep the consumption of sugar down, the chromaffin system (or, to mention its chief constituent, the suprarenal gland) tried to increase its consumption. But the pancreas was in turn controlled by the thyroid gland, the parathyroids, and the hypophysis, while the chromaffin system was under the control of the central nervous system. All these controls, except that of the central nervous system, were exercised by the medium of the secretions of the various glands concerned, conveyed about the body by the blood stream. The regulation of the glycogenic function of the liver by the pancreas and chromaffin system in the normal subject was such that the blood contained from 6 to 8 parts of glucose per 10,000. In diabetes this quantity was increased, either because the inhibiting power of the pancreas was weakened, speaking generally, or because the augmenting power of the chromaffin system was increased. In Claude Bernard's diabetic puncture of the brain, for example, the glycosuria was due to the central stimulation of the chromaffin system. Acidosis was fatal through the removal of the ammonia and alkaline bases from the body in excessive amounts. Diabetic coma was the expression of alkaline poverty of the tissues. Coming to the treatment of diabetes, Professor von Noorden was on familiar ground; the subject is one on which he is an authority *nulli secundus*. Drugs, he said, were but little given to diabetics as such nowadays; the treatment consisted almost entirely in setting each patient to live on exactly the diet that suited him best. A sugar-free diet was first given to reduce the glycosuria to the lowest possible value; in favourable cases the sugar disappeared from the urine. The next step was to ascertain by direct experiment what was the limit of the patient's tolerance for carbohydrate; sugary or starchy foods were added cautiously to the dietary, and their effect in producing glycosuria was carefully watched. These tolerance tests required the constant supervision and regulation of the physician. It was most important that the body's sugar manufactories should at no time be overburdened; the urine must be kept as free from sugar as possible, or the disease would progress. Too much must not be expected from such treatment; there would always be cases that progressed in spite of the greatest care, because the lesions on which the disease depended were sometimes inevitably progressive. In severe cases he advised the adoption of alternating periods of carbohydrate feeding and carbohydrate starvation. Most diabetic patients should have plenty of fat in their diet; in severe cases two or three ounces of whisky should be given every day. Ten years ago Professor von Noorden invented his well-known "oatmeal cure"; first the glycosuria must be reduced by strict dieting, then about half a pound of oatmeal a day should be added to the diet for several days in succession. The oatmeal treatment was found to do good, but for what reason it did so was not understood. Banana cures and flour cures, worked on similar lines, had also been employed successfully.

Professor G. Rosenfeld (Breslau) then read his paper on the effect of giving various forms of carbohydrate that were not chemically related to glucose to diabetic patients. Many such carbohydrates had been tried with varying and inconstant degrees of success; glycerine, arabinose, inulin, lactose, and others were specially to be mentioned. He brought forward a new carbohydrate that seems not to increase the sugar-production of diabetics, known by the commercial name of "hediosite"; the name by which it is known to the chemist is "alpha-glycoheptonic acid." It is, he said, well absorbed; most patients could take from 1 to 2 oz. of it a day, many could take 3 or 4 oz., but the larger doses might set up diarrhoea. It was a form of carbohydrate that could be utilized and burnt up by the tissues of even the worst cases of diabetes, and in some unexplained manner it seemed to lessen the glycosuria.

Various other points were discussed by the readers of half a dozen papers subsequently.

Dr. Cammidge (London) introduced to his hearers a new urinary test—the iodine coefficient of the urine—whereby it was possible sometimes to foresee the appearance of sugar in the water of patients with pancreatic disease some weeks beforehand.

Lieutenant-Colonel K. Prasad, I.M.S., gave an account of diabetes in India; it was not, he said, a rare disease among the Hindus, and their medical men treated it mainly by drugs that soothed the nervous system. Dieting did not occupy a large place in the treatment, and only a very mild degree of limitation was put on the consumption of carbohydrate. A uniformly bad prognosis was given.

Dr. Labbé (Paris) was on well-trodden ground when he read a paper proposing to divide diabetics into two classes clinically—the fat diabetics and the thin.

Professor Saundby (Birmingham) spoke on a number of practical points that should be kept in mind by practitioners who had to treat diabetes. He urged that too much meat should not be given; too much meat was almost as bad as too much carbohydrate. It was important to remember that many of the diabetic foods advertised as free from starch were not by any means free from it. He could not agree with Professor von Noorden's advice to give large quantities of alcohol to these patients.

Discussion on Chronic Arthritis.

On Tuesday, August 12th, Professor L. F. Barker (Baltimore) opened a discussion on the differentiation of the diseases included under the title "chronic arthritis."

Professor Barker gave his hearers an exhaustive survey of the history of the nomenclature that has burdened and confused these chronic joint troubles. In the earliest days any acute disease of the joints was called arthritis, any chronic disease was called gout. G. D. Baillou about three hundred years ago reversed this, describing chronic conditions as arthritis, acute inflammations of the joints as rheumatism. Rheumatoid arthritis was a name invented in 1859 by Garrod. The more recent classifications of joint troubles showed greater complexity; thus a few years ago Hoffa and Wollenberg divided all chronic joint affections into two main classes, the infectious cases and the non-infectious. Each of these classes was subdivided into five further divisions. Professor Barker noted with satisfaction that, nowadays at any rate, the term "gouty" was applied only to cases with a definite disturbance of the protein metabolism. Rheumatism, on the other hand, could not be as closely defined; speaking as if he were unacquainted with the researches of Poynton and Paine, he went on to add that the microbe of rheumatic infection was unknown to us, unless it were a streptococcus very recently isolated by Rosenau. He commended the modern tendency to restrict the terms "rheumatic" and "rheumatism" to true acute rheumatic fever and its chronic sequels—if, indeed, it were the case that such a fever had any chronic sequels in the affected joints. Many classifications of chronic arthritis had been attempted on pathological, or etiological, or morphological bases, or, worse still, on mixed criteria. In conclusion, he distinguished five main types:

1. The gouty.
2. The nervous.
3. Arthritis deformans.
4. Chronic infective arthritis.
5. Primary progressive chronic arthritis, apparently not due to any infection.

Professor Barker then dwelt on the fact that in proportion as our knowledge increased, so were we able to transfer cases from group 5, with its unknown etiology, to group 4, in which the bacteria causing the arthritis were known. Complete knowledge, he believed, would some

day enable us to empty group 5 into group 4 altogether; at present, however, this could not be done. It was a remarkable thing that cases falling into group 5 had been reported from all countries.

Professor F. von Müller (Munich), who followed, gave a very full and most instructive account of the pathology of chronic arthritis. A special feature of his address was the skill with which he figured on the blackboard the many morbid changes that might be met with in such conditions. Many of these changes, he pointed out, were of a degenerative rather than an inflammatory nature, particularly in those forms of chronic arthritis in which hypertrophy was a marked feature. He drew attention to the curious arthritic and periostitic changes not rarely met with in patients suffering from non-inflammatory mediastinal new growths.

Dr. Preston King (Bath) deplored the unhappy terminology employed in descriptions of chronic arthritis, and agreed with Professor Barker in believing that his fourth and fifth groups would one day be merged.

Professor Singer (Vienna) spoke of the care needed in discriminating those cases of chronic arthritis due to tuberculosis or syphilis from the other varieties.

Dr. J. B. Burt (Buxton) emphasized the important actions of exercise and work in determining the exact nature of the changes produced in chronically inflamed joints. Very similar changes—he called the phalanx of a London cab-horse to witness—might be produced by overwork alone; hence many of the hypertrophic changes in the bones of chronic arthritis might well be due to the work done, the use made of the joint, and not to the inflammation at all.

Dr. Hale White (London) expressed his belief in the unity and existence of a chronic arthritis that had been recognized in this country for more than half a century under the name of "rheumatoid arthritis." It was correctly placed by Professor Barker in his fifth group of cases; Dr. Hale White believed that it was due to a specific microbe that had not hitherto been isolated, and pointed out that the primary change, seen in early cases of rheumatoid arthritis, was confined to the synovial membrane.

Dr. Poynton (London) pointed out that whereas in days gone by chronic arthritis was attributed to errors of metabolism, at the present time the tendency was to attribute it to infection in every case. He believed that the truth lay somewhere between these two views. Injected intravenously into the rabbit, the rheumatic streptococcus isolated by Paine and himself was capable of producing any and every variety of chronic arthritis; further, the effusions withdrawn from such joints would often prove sterile, although there could be no reasonable doubt that they were in reality infected with the rheumatic streptococcus.

Dr. A. E. Garrod (London) deprecated the want of an international nomenclature, by the use of which the confusion at present reigning in the description and classification of cases of chronic arthritis by the writers of different nationalities might be got rid of. Modern treatment was undoubtedly better than the old, as was proved by the smallness of the number of very severe types of chronic arthritis to be seen nowadays.

EXPERIMENTS ON ANIMALS.

At the beginning of the morning's session, on Tuesday, August 12th, the President, Sir William Osler, put to the crowded audience a motion affirming the importance and necessity of vivisection, carried out as it is under due control, for the progress of medical science. The motion was carried unanimously. A vote of thanks to the President and the General Secretary of the Congress was also put to the meeting and was carried by acclamation.

INDEPENDENT PAPERS.

At the afternoon session on Monday, August 11th, the Section divided its forces into two. The papers read at the one part dealt with such subjects as duodenal ulcer, peptic ulcer, and functional tests of the liver.

Pneumothorax Treatment of Tuberculosis.

The pneumothorax treatment of pulmonary tuberculosis was expounded by Dr. Saugman, of the Vejlefjord Sanatorium. He had treated 186 patients and made some 5,000 punctures of the pleural cavity; he gave a statistical summary of his results. One patient who had been ill for nine years, and had a destructive infiltration of the whole of the left lung, had been treated with artificial pneumothorax successfully for five years; she had had no fewer than 106 inflations of the pleura, and continued fit for work and social life. The treatment was suitable for many of the advanced cases for whom no other method of treatment held out any hope of relief.

Test for Functional Efficiency of the Liver.

Dr. Rowntree (Baltimore) read an interesting paper on a new test for ascertaining the functional efficiency of the liver. Experiment had shown, he said, that the normal human liver excreted into the intestine some 30 per cent. of a dye—phenoltetrachlorphthalein. When the liver was diseased, the percentage of the dye thus excreted lessened; the test should be of service in a number of morbid conditions in which information as to the functional activity of the liver was desirable.

Duodenal Ulcer.

Professor M. Einhorn (New York) gave an account of the diagnosis and treatment of duodenal ulcer, recommending in no uncertain tones that its subjects should generally receive medical rather than surgical treatment. Complete rest was a most important factor in any treatment that might be advised. He also introduced to the audience his method of duodenal alimentation. The patient swallows a fine tube of soft rubber; when its orifice lies well in the duodenum, the tube is used for the passage of liquid food.

Dr. Bradshaw (Liverpool), who subsequently read a paper giving his own highly satisfactory experience with a modified Lenhartz treatment of peptic ulcer, raised the objection that the contact of this tube with the duodenal ulcer was little calculated to promote the complete rest that Professor Einhorn had advocated earlier in his paper. But rest is a relative term, Professor Einhorn replied, and the possible contact with the rubber tube was much less irritating to the inflamed or ulcerated duodenum than the passage of gastric contents, inevitable if the patient was fed by the mouth, would assuredly be.

Diagnosis of Pulmonary Embolism.

A number of other papers were read; among them was one by Dr. L. A. Conner (New York), who had been recently struck by the resemblance to lobar pneumonia that might be presented by cases of pulmonary embolism. The emboli were detached fragments of venous thrombi. He referred to the well-known fact that the signs and symptoms of pulmonary embolism might be the first thing to draw attention to the existence of thrombosis in a patient's venous system.

Laparoscopy and Thoracoscopy.

Dr. H. C. Jacobaeus (Stockholm) gave an admirable account of the practical utility of laparoscopy and thoracoscopy. This method of physical examination entails the puncture of the abdominal or chest wall with a stoutish trocar. The trocar is fitted with an electric lamp and eye-piece, and is so constructed that when its point has been introduced into a cavity the lamp can be lit and the observer can examine the contents and the walls of the cavity directly with the naked eye. Dr. Jacobaeus said that he had used the method in some 200 cases, and had never found it did harm to the patient. He quoted a number of instances in which it had yielded him useful information about the patient's viscera, and a number of coloured drawings were thrown upon the screen exhibiting the appearances seen through the laparoscope (or thoracoscope) in such cases as tuberculous peritonitis, cirrhosis of the liver, abdominal tumour, pleurisy, and the like.

The meetings of the Section of Medicine came to an end with the morning session. Every one of its meetings was well attended—even the meeting held on Saturday afternoon, an afternoon that is commonly held sacred to play in this country. The President and Secretaries are to be congratulated upon the skill and success with which they got through so heavy a programme of work in the five days on which the Section met.

SURGERY.

THE SURGERY OF THE ARTERIAL SYSTEM.

PROFESSOR RUDOLPH MATAS (New Orleans) who had been chosen to lead the debate on Saturday, made a rapid survey of the whole range of this new movement in surgery. He described the suture of the blood vessels, both arteries and veins, arterio-venous anastomosis of various kinds, the transplantation of arteries and veins, and brought forward laboratory as well as clinical evidence to show the feasibility of these various procedures. In regard to vascular implantation of arteries and veins autogenetic methods were more suitable than heterogenetic, though these were not wanting in success. The segment of an artery or vein could be grafted to another, or branches of a parent trunk could be reimplanted on the same vessel at different levels. Arteries and veins could be patched with portions of blood vessel and other material. He spoke also of the implantation and transplantation of organs and limbs by vascular anastomoses. But the main portion of his paper was devoted to the method of treating aneurysm by suture associated with his name—intrasaccular suture or endoaneurysmorrhaphy. The latest statistics included an analysis of 215 reported cases. The results fully justified the confidence placed in this operation.

Mr. C. A. Ballance recognized that the surgery of blood vessels had advanced greatly. It was now known that wounds of the heart and of arteries and veins could be sutured, and that transplantation of portions of arteries was possible; there were many other operations on blood vessels in daily use in practice as well as in the laboratory. He specially spoke of the obliterative and reconstructive treatment of aneurysms recommended by Matas, and thought that since Hunter no advance had been made till Matas began his work. Mr. Ballance added, however, that except in the treatment of aneurysm of the aorta and some other great vessels, and in special circumstances, he did not think it probable that Matas's method would find general acceptance. He regarded popliteal aneurysm as the type best suited for Matas's operation, but nevertheless thought that the practical advantages and the extreme simplicity of the Hunterian operation still prevailed. He thought the Hunterian operation for popliteal aneurysm was the greatest advance in surgery ever made by the single act of one man. Matas's operation should be reserved for those cases in which the older operation was inapplicable.

Dr. A. L. Soresi (New York) showed his apparatus for suture of blood vessels. He had had made a small clamp which held the ends of the vessels to be joined in such a way that minute hooks held back a cuff so as to expose the intima all round. Then intima was sutured to intima by the insertion of very small gold wire clamps after the fashion of Michel's clamps. A single row of these was enough to effect a complete and safe junction. The members of the Section greatly admired Dr. Soresi's neat and ingenious apparatus, which, he said, he had thoroughly tested in the laboratory.

Dr. Danis (Brussels) recalled that Professr Oppel of St. Petersburg had said that ligation of both artery and corresponding vein gave a better final circulation than ligature of the artery alone. The principle was sound, but on one condition only—that the vein should be tied after the occlusion of the artery. He had proved the efficacy of the method and the truth of the principle by some experiments.

Dr. Ernst Jeger (Berlin), who has taken the place in Germany corresponding to that held by Carrel and Guthrie in other countries as an experimenter in blood vessel surgery, gave a short account of some of his studies. Eck's fistula, or anastomosis between portal vein and inferior vena cava, he had performed repeatedly on dogs. Magnesium tubes were a useful support to blood vessels in suturing, as the magnesium afterwards became absorbed. He demonstrated specimens of transplanted kidneys from their normal situation to the neck, the carotid artery being joined to the renal artery and the jugular vein to the renal vein. He had even inserted one end of a piece of vein into the left ventricle of the heart, and the other into the aorta, so that the aortic valve was put out of use. Most of these experiments were performed on animals, but he was hopeful that in time they would become applicable to the human subject in suitable cases.

Dr. Goodman (New York) gave some account of his work. He maintained that suture was preferable to the clamps of Dr. Soresi.

A lady laboratory worker from St. Petersburg, Mdlle. N. A. Dobrowolskuja, showed her method of suture and some preserved specimens of blood vessels after firm union. Her method did not appear to differ materially from the well-known technique of Carrel, except that the ends of the vessels were split so as to give a larger area for suture.

The experience of Dr. V. Soubbotitch of traumatic aneurysms in the Balkan war was interesting. The majority of the cases had to be treated by the older methods, but in some cases he and his colleagues were able to suture arteries and veins with moderately good results.

Dr. Chiasserini (Rome) had performed 13 experiments in transplanting flaps of fascia lata in repairing aorta or other large vessels with such success that he recommended that tissue as very suitable for the purpose.

Professor Matas, in reply, admitted that it was the work of Ballance and Bowlby which induced him to persevere in perfecting his own method of aneurysm suture. He agreed that the Hunterian was a highly successful operation, but when he looked over the records of his work and that of others he thought that his operation was the best. Nor could he agree with Dr. Danis, because he had lost cases where the vein had been ligatured or wounded in aneurysmorrhaphy. In operating on carotid aneurysm he applied a metal band around the vessel for six or seven hours before operation was contemplated to test the circulatory value of the circle of Willis. This occluding band could actually be left on the artery for three days without injuring the vessel or damaging the cerebral circulation. If no sign of interference showed itself the operation could be proceeded with. He recommended that the condition of the collateral circulation should be tested before aneurysmorrhaphy in all situations.

THE PRESENT STATE OF INTRATHORACIC SURGERY.

This was the subject on Tuesday of the last general discussion in the Section of Surgery. There was a very large and interested audience. The reporters were Professor F. Sauerbruch (Zurich) and Professor Tuffier (Paris). There were present also many other distinguished surgeons: von Eiselsberg (Vienna), Kocher (Berne), Laplace (Philadelphia), Macewen (Glasgow), Bastianelli (Rome), Lucas-Championnière (Paris), Delagénière (Le Mans), Ingianni (Genoa).

Professor Sauerbruch said that the factors which had been of most importance in the development of surgery of the chest were, in the main, three. First came the improvement of diagnosis by means of Roentgen rays; by this method changes in the lung substance, the formation of cavities, the presence of tumour, the stages of tuberculous disease, could be demonstrated, and the alterations and improvements following treatment could be traced. Next he placed the experimental researches on pneumothorax. The last factor was the introduction of methods to determine the difference of pressure within the lung in relation to atmospheric pressure. His own experience was that operations on the lungs were best performed by the aid of special apparatus to establish a negative pressure—that was, that the operator and the whole of the patient, except his head, were in a chamber whose pressure was less than the atmospheric pressure, so that collapse of lung did not occur when the pleural cavity was opened. The same object was attained in the reverse manner by making the patient breathe in a small chamber whose internal pressure was higher than atmospheric pressure; this was known as positive pressure. By these methods exploratory opening of the chest cavity was as simple an operation as exploratory opening of the abdominal cavity, and tumours could be removed. Bronchiectasis was treated by opening into the lung cavity, and drainage. He had cut the phrenic, and performed artificial pneumothorax for the purpose of putting the affected lung at rest. In tuberculous disease of lung he had performed Freund's operation of cutting the costal cartilages of some ribs to permit immobilization of the lung, and had also endeavoured to bring about the same object by artificial pneumothorax, thereby causing collapse of the lung.

In the Zurich hospital in 1910–13 he had operated on 183 cases of lung disease, as follows:—

1. Extra-pleural thoracoplasty, 113 cases (27 bronchiectasis, 86 tuberculosis).
2. Cavities opened, 5 cases.
3. Phrenicotomy, 24 cases.
4. Paraffin injections, 8 cases.

(*a*) Thoracoplasty—cavernous phthisis without rupture of cavity 74 cases, and (*b*) with rupture of cavity (pyopneumothorax), 12 cases.

In class (*a*) 17 were healed, 19 were greatly improved, 21 were improved; all the others died or were not improved.

In class (*b*) 6 were cured, 5 died, 1 was still under treatment.

Professor Tuffier's report was read in his absence by Dr. Caillard. The ground covered was similar to that by Professor Sauerbruch.

Sir William Macewen's contribution to the debate was by far the most interesting and informing of the day. He drew attention to two points. In the first place, he demonstrated a patient operated on by him eighteen years ago, whose left lung had been removed in its entirety for tuberculous disease. The patient had been brought from Glasgow, and was seen by the Section to be a strong, healthy-looking man whose left side was hollow and fallen in. He was engaged steadily at work. At the time of the operation the right lung was diseased, but the removal of the hopelessly diseased lung was followed by improvement in the condition of the remaining lung. The same experience had been found in four other similar cases. In all these cases the apex of the diseased lung had been adherent to the great vein at the root of the neck, and at a later stage in the last four cases the vein and that piece of lung were removed. In the first case the patient for some days suffered great distress from the "flopping" of his heart to and fro as his position was changed. This symptom was obviated by stitching the pericardium to the front part of the chest wall. Photographs of the five men operated on were shown, as also were photographs of the lungs removed. Sir William Macewen's second point was with regard to the differential pressure theories and apparatus of Sauerbruch and others. His belief was opposed to theirs that all these elaborate apparatus were necessary. It was not atmospheric pressure which held together the two surfaces of the pleura, the lung surface, and the inner lining of the chest wall. When a boy played with a leather sucker in the streets it was not atmospheric pressure that enabled that boy to lift things up with the wet sucker. He had there two such suckers of leather, which he wetted and stuck together with no interposing air. The string attached to one he gave to Professor Kocher to pull while he held the string of the other, and the string broke in the joint efforts to separate these two suckers. Now Sir William went on to show that it was not atmospheric pressure which held them together. He had consulted the late Lord Kelvin, and he had recognized that it was a much greater force, and he suggested it should be called "molecular cohesion." Professor Macewen proved to the Section by an experiment on the table that atmospheric pressure did not hold together two pieces of glass of uniform smooth surface, another well-known schoolboy trick. He put a weight on the lower glass and had it suspended within a bell jar which was rendered a vacuum by a pump, and the weight did not fall. Similarly, he believed that the pleural surfaces were held together by molecular cohesion, and that so long as the opening in the pleural cavity was patent to the atmosphere the collapse of the whole lung would not take place. He did not fear collapse of the part of lung he was dealing with, at any rate, as collapsed lung did not bleed; indeed, he could squeeze the blood out of it with his fingers. In regard to cancer of the lung, he had given patients great relief by opening into the lung cavity, clearing out the pus and broken-down lung substance, and allowing the cavity to close by granulations. He had not cured the cancer, but the patient's death was easier.

Mr. Morriston Davies (London) spoke on the production of artificial pneumothorax for phthisis by collapsing the lung and also on immobilization of the ribs for the purpose of keeping the lung at rest in phthisis. He advocated strongly frequent and repeated radioscopic examination. In experiment and in operation he had prevented shock by injection of 2 per cent. novocain into the vagus nerve. His last point was to recommend the injection of oxygen into the chest cavity at the same time as fluid was being drawn off in cases of empyema or pleuritic effusion.

Dr. Armstrong (Montreal) showed some charts to demonstrate the movements of the heart in a man of 46, who was shot in the region of the heart, the bullet lodging and lying loose in the pericardium. The bullet was successfully removed from the pericardial cavity five days after the accident.

Dr. Meltzer and Dr. Charles Elsberg (New York), Mr. G. E. Gask (London), and Dr. Danis (Brussels) all demonstrated methods of anaesthesia to be employed in operations on the lungs. All except the last were for intratracheal insufflation of ether.

Dr. Meltzer, the pioneer and introducer of this form of anaesthesia, said that the principle of the intratracheal administration of ether was now well known. Warm, moist, and etherized air was supplied to the patient at the bifurcation of the trachea by means of a catheter passed through the glottis. The air was under pressure, and as the catheter was only half the size of the glottis, the excess of air escaped easily between the catheter and the glottis; it remained, however, under sufficient pressure to expand the lungs, and, being constantly renewed, sufficed for respiration. Though primarily designed for the performance of surgical operations on the thorax, the method possessed the following further advantages in general surgery:

1. By its means thoracic surgery was rendered possible without resorting to the cumbersome and costly positive and negative cabinets.
2. In mouth, nose, and throat operations there was no danger of the inspiration of blood, mucus, or pus.
3. In goitre operations air was supplied below the tracheal obstruction.
4. In head and neck operations the anaesthetist was well out of the way of the surgeon.
5. It rendered easy, from the slight respiratory movements, operations on the upper part of the abdomen; and
6. It was a most efficient artificial respiration apparatus.

INDEPENDENT PAPERS.

Direct Transfusion of Blood.

Dr. A. L. Soresi (New York), in discussing the value of direct transfusion of blood, held that it was not so often practised as it ought to be. He had performed a series of 600 operations by a technique specially adapted. He recommended joining the ulnar vein of the donor to the external jugular vein of the recipient. The operation was always performed with local anaesthesia, and both patients were extremely comfortable. The apparatus suggested by him held the ends of the veins in accurate apposition (intima to intima), and in this point lay the secret, because thrombosis never took place. The members of the Section were greatly interested in Dr. Soresi's ingenious and neat apparatus.

Control of Haemorrhage from the Liver.

A new method of controlling haemorrhage in operations on the liver was suggested by Dr. Charles Borszeky (Budapest). He had controlled the hepatic artery by means of a clamp, one blade of which was in the foramen of Winslow, and the other over the hepato-duodenal ligament. He had employed this manœuvre in 11 cases, in 2 cases with no success. The duration of compression ranged from fifteen to seventy minutes, and in every case it was harmless. Dr. Borszeky was understood to say that a Kocher's forceps was the instrument employed.

Arterio-venous Anastomosis for Impending Gangrene.

Dr. Charles Goodman (New York) read a paper on arterio-venous anastomosis for impending gangrene, containing records of his experience in 15 operated cases. The establishment of anastomosis between vein and artery was first done by Carrel successfully in dogs in 1902. Since then many cases had been operated on with variety of results and with variety of opinions as to the usefulness of the operation. Obliterative endarteritis was an ascending process, and while both arteries and veins might become involved the changes in the arteries preceded those in the veins. The process rarely extended beyond the femoral vessels. He recommended the following points in technique: In isolating the vessels preliminary ligation of all small branches was necessary; careful removal of all adventitia was required; thorough perfusion of the lumen to remove all fibrin and covering of the exposed vessels

with liquid petrolatum, paraffin, or vaseline, were required to prevent thrombosis. Suture were passed through all coats. The line of sutures on the intima was soon covered by a layer of epithelium and was quite smooth so that thrombosis did not occur. There were six successes out of 15 cases. The ages ranged from 28 to 87. Several cases which promised success later required amputation (8 cases), but even these patients received temporary relief from pain. The results on the whole seemed to warrant the conclusion that the operation was worth trying in suitable cases as it afforded the only hope except amputation, for threatened gangrene. He used very thin black Oriental silk and No. 16 needles.

Mesenteric Thrombosis and Thrombo-phlebitis.

Dr. Ernest Laplace (Philadelphia) described cases of arterial thrombosis and thrombo-phlebitis of the mesentery. Gangrene was inevitably the result of this condition. He had made some experimental investigations to elucidate the pathology. Analogous conditions were found in thrombosis of the femoral and sometimes iliac veins on the left side in appendicitis and also in enteric fever. The occurrence usually took place in afebrile cases of appendicitis. In so-called "clean" cases they might have this happening. His view was that some degree of infection was present; it was not a disease in itself, and that thrombosis might take place anywhere, let it be femoral vein, pulmonary artery, or mesenteric veins. The only sure way to prevent it was to maintain rigid asepsis, and in every abdominal case, even the afebrile type, to administer by the Murphy drip, 40 drops to the minute, a solution of 1 in 500 citric acid, which he thought would make the blood less prone to infection, would restrain the growth of germs.

Sir Frederic Eve pointed out that thrombosis of the left femoral and iliac veins were due to minimal infection, but it was a long step to admit the infective theory for all cases. Mesenteric thrombosis might occur without gangrene, as he had experienced.

Treatment of Old Dislocations by Operation.

At the session on Monday afternoon, August 11th, Professor Dollinger, Budapest, read a paper on the treatment of old dislocations of joints, with special recommendation of operative methods. In 150 cases there were 54 old dislocations of the shoulder: 45 were treated by arthrotomy, 8 by primary resection, 1 by osteotomy, and of these 46 healed without complication. In the elbow he had 64 cases: 39 were treated by arthrotomy and 29 by resection, with 59 good results.

The hip-joint was very suitable for treatment; there were 22 cases, comprising 16 arthrotomies and 5 primary resections, 16 good results; suppuration occurred in 18 cases. Function has been in some restricted, but in all cases the function was better than before reposition. Reposition, he believed, was generally possible in these three joints, and arthrotomy was better than the old conservative measures.

Ambulatory Treatment of Fractures.

Professor Dr. Hackenbruch (Wiesbaden) demonstrated an instrument to permit the ambulatory treatment of fractures. Models were shown, and a patient also was exhibited with the apparatus fixed. Cases of fracture of the femur would go about in sixteen days. The apparatus was fixed in plaster-of-Paris bandage, and was so devised with screws that extension could be made and various rotary and lateral movements made.

Dr. Fischer (Budapest) also demonstrated an apparatus for treatment of upper limb fractures, and Dr. Latis Bey (Alexandria) showed a simple apparatus for maintaining the position of the arm in dislocation and fracture of the humerus.

The last meeting of the Section took place on Tuesday afternoon, and was short.

Bismuth Paste in Sinuses.

Dr. Emil G. Beck (Chicago) gave an account of the bismuth paste treatment of suppurative sinuses and empyema, but had nothing new to add to what he had already published. Dr. Salatich (New Orleans) recommended the use of vaseline only, but Dr. Beck said he had already tried it, and had had to revert to the bismuth mixture.

Ovarian Grafts.

Dr. S. Voronoff (Nice) gave a most instructive account of experiments he had done in ovarian grafts in sheep. Each experiment comprised operations on two ewes. Under local anaesthesia he removed the ovaries of one and put in their place the ovary of another ewe. In practically every case the ewes bore healthy lambs and were really not much affected by the operation. Six of the ewes operated on two years ago and four ewes one year ago were alive and well.

DEMONSTRATIONS.

At the afternoon sitting on Friday the papers read were mostly devoted to subjects of general interest.

Mr. Evans (London) showed a patient, a woman aged 43, in whom the larynx, part of the pharynx, and the upper part of the oesophagus as far down as his fingers could reach, had been removed for carcinoma four years ago, and who had now used a rubber substitute for the oesophagus. The patient was plainly in excellent health, and had married one year after the operation. The specimen was shown, and Mr. Evans reported it to be a columnar-celled epithelioma. The patient breathed through a tracheotomy tube; her food, after being chewed, was swallowed, and then it passed into a rubber tube the end of which projected into the mouth just at the base of the tongue. This tube then passed out from the neck below the hyoid bone, and was conducted outside the body to a gastrostomy opening. This artifical gullet was adjustable by the patient, who boiled it regularly. The tube was hidden by her clothing, and no one could tell she had not a normal oesophagus. Mr. Evans was heartily congratulated on his success and ingenuity.

The second demonstration was by Dr. Keppich (Budapest), who showed an instrument for suturing intestine or stomach invented by Professor Hültl. The principle was similar to that adopted in the staple fixing or binding machine for books or pamphlets. The staples were of silver wire, and, after the clamps were adjusted, three and a half turns of the handle in as many seconds inserted a double row of sutures. There was sufficient space between to cut the tissues. Haemostasis was perfect, and all that was required then was a few Lembert stitches to infold the sutured edge.

ORTHOPAEDICS.

THE TREATMENT OF ANKYLOSIS.

THE report by Dr. W. S. Baer (Baltimore, U.S.A.) on the treatment of ankylosis aroused very great interest, for the experimental researches upon which his operations were based had enabled him to proceed on an assured footing, and the good percentage of success in his cases was most encouraging. He said that ankylosis in a bad position formed a crippling deformity, and when it affected the temporo-maxillary joint might imperil life, because the patient could not take proper food in a natural manner. Until within recent years the eradication of disease was almost the sole object of orthopaedic surgeons. The introduction of asepsis, which had rendered operations safe, and of *x* rays, which gave much increased knowledge of the condition and position of bones, together with accumulated experience, had led to attempts to restore physiological function. There were various methods of attempting this restoration, and they had various degrees of success. *Brisement forcé* was of use only in pseudo-arthritis, while arthrolysis was of use only in periarticular lesions. In fibrous or bony ankylosis it was always followed by reformation of adhesions. Resection of joints, when the locality allowed of enough bone being removed without too great mutilation, as in the elbow and shoulder, gave sometimes useful and movable joints, but in general its result was ankylosis. Transplantation of entire joints had been attempted with some measure of success. Arthroplasty aimed at forming a movable joint by interposing inorganic or organic materials between the bone ends. The organic material interposed in arthroplastic operations might be living or dead. When living it was generally derived from tissues in the neighbourhood of the joint, of which a flap was turned in between the bones but left attached by a neck to maintain nutrition. These living flaps might be muscular, fibrous, or fatty, or compounded of any of the connective tissues available. The objections to them in practice were the occasional pain in

the flap when squeezed between the bones, and the great limitation of adaptation to the bone end, due to the presence of the attached neck, which rendered it impossible generally to fit the tissue accurately round the contour of the bone end. Dr. Murphy (Chicago) had said that the fibro-fatty flap developed into hygromatous material, but other observers had not found in experiments on animals that any endothelial lining was developed on such flaps. Any medium which would effectually separate the bones or joint surfaces until the formation of smooth fibrous material over them would be effective. Experiments had induced Dr. Baer to try in the human patient pig's bladder, which was sterilized by heat and packed in convenient sized pieces in germ-proof envelopes; it was ready for use after ten minutes' soaking in saline solution to render it pliable. It could then be modelled accurately round the end of the bone and secured with points of suture of sixty-day catgut directly to the periosteum. The membrane remained *in situ* for from sixty to one hundred days, after which it ceased to exist as a foreign body, having been invaded by cell growth and absorbed, and its place taken by connective tissue. With this membrane there was less chance of infection, because much less handling was needed than was the case when attached flaps were used. Dr. Baer had operated upon 52 joints, using this membrane. These 52 included 4 temporo-maxillary, 23 hip, 19 knee, 3 phalangeal, 1 ankle, and 1 radio-ulnar joint. He had obtained painless and useful voluntary movement in 71 per cent. of these cases. The hip-joint gave the best results—namely, 87 per cent. of success. In the temporo-maxillary joint he had very good results. The 23 cases included the results of tuberculous, gonorrhoeal, and septic processes, and also arthritis deformans. Only one case used any aid in walking, and that was one crutch. In tuberculous cases it was necessary to make sure that active disease was at an end. He preferred to approach the hip by the anterior incision and preserved as much as possible of the capsule of the joint, which was afterwards closely sutured with fifty-day catgut. He preferred not to drain, though the presence of the membrane caused serous effusion, but this kept the capsule away from the bone, which was an advantage. He showed on the screen photographs in which 90 degrees of flexion-extension and 25 degrees of abduction were evident. In gonorrhoeal cases the results were not so good, and he recommended that operation should be deferred until one year after all active trouble had ceased. In a case of osteomyelitis of the humerus and arthritis of both hips, with complete bony ankylosis, he had obtained about 75 degrees of flexion-extension. Abduction in all cases was generally limited by bony contact, but was enough to be useful in progression. In the knee, when there was fibrous ankylosis of the femur and tibia, and bony or fibrous ankylosis of the patella and femur, the results of operation were always good despite the destruction of the crucial ligaments. In bony tibio-femoral ankylosis the results were not very good. In the one ankle case he obtained 43 degrees of voluntary movement.

Professor Putti (Bologna), who spoke in French, presented the following summary of his report:

1. That the indications for mobilizing a stiff joint depend on the causes of the ankylosis, on the anatomo-pathological conditions of the joint, and the state and social and physical conditions of the patient.
2. The technique required; the observance of the following points:
(*a*) Orthopaedic and modelling resections, in order to secure an easy functional play of the limb.
(*b*) Thorough destruction and removal of all such elements as might cause new formation of bony or connective tissue.
(*c*) Interposition between the resected bone ends of soft parts, to oppose new bone formation, facilitate articular play, and favour the reconstruction of the joint surfaces and of the synovial sac. Free aponeurotic flaps taken from the fascia lata were best.
3. Every articular mobilization required a long and appropriate post-operative treatment.
4. The prognosis was favourable not only for the upper limbs but for the hip, knee, and foot. Bad results were to be ascribed to errors of selection of cases and of technique. It was demonstrated that it was possible to obtain joints functionally like the normal, and certain that every joint had its own prognosis.

Dr. Helferich (Eisenach), who spoke in excellent English, reviewed the history of this matter. Results were somewhat uncertain, sometimes too loose joints were produced and sometimes fresh ankylosis. The *via media* was difficult to attain. He had operated on the temporo-maxillary joint in 1893, turning in a flap. Improvement of movement followed. It was well to remove as little bone as possible. Traumatic cases gave the best results. He was surprised that Baer had operated on few or no elbow joints, because the elbow in Germany was one of the joints most often affected. Finally, in the interest of true progress, he appealed to all surgeons to publish all their cases, good or bad.

Professor Vulpius showed *x*-ray pictures of good results, especially in the hip and elbow.

Professor Kirmisson described the poor result of an operation on the knee for the instruction of his confrères.

Dr. Rocher (Bordeaux), Mr. Muirhead Little, and Dr. Royal Whitman also spoke.

Discussion on the Treatment of Tuberculous Joints in Childhood.

A very interesting discussion was elicited by the valuable reports of Professor Julius Dollinger (Budapest) on the general subject, and of Dr. Ridlon (Chicago), who limited himself to the mechanical treatment of hip dissase.

Dr. Dollinger's report, which consisted of sixty-three pages fully illustrated, amounted almost to a monograph on the subject. Speaking in English, he said that in the local treatment the essential in acute and subacute cases was the fixation of the articulation, and in tuberculosis of the lower extremities suspension was necessary to render possible ambulatory treatment by means of the apparatus shown in the illustrations to the report. If fixation had been begun before tuberculosis had destroyed the anatomical form of the articulation, movement would return spontaneously during fixation, without the use of passive movements. Forced passive movements were harmful and caused relapses by lighting up fresh inflammation. The treatment of contracture should begin in every stage of inflammation with gradual restoration of the joint to a good position. As to general constitutional treatment, Dr. Dollinger regarded the sunlight treatment as important, but criticized the effects falsely imputed to it and the local treatment with which it was accompanied. He believed that it was fixation and not the sun's rays which caused the cessation of pain, but admitted that it was impossible to estimate how much of the improvement was due to the sun and how much to rest and pure fresh air; he believed, however, that the year-long lying down with which the sun treatment was combined was superfluous and harmful, and recommended a combination with ambulatory treatment. In the treatment of cold abscess after trying various other means, he had come back to evacuation with a trochar and the injection of iodoform emulsion. He regarded with great interest the experiments which had been made with the quartz lamp and the *x* rays in the place of sunlight. It almost seemed as if it would soon be possible to cure all early cases without operation which should only become necessary in neglected and exceptional cases.

Dr. John Ridlon's report was read by Dr. Torrance Rugh. He said that by hip disease was meant any chronic inflammation of the hip-joint that was not distinguished from tuberculosis, and, when left untreated, resulted in more or less diminished range of motion at the joint, with usually some deformity, and frequently shortening of the limb. All cases of hip disease demanded mechanical treatment; only a very small percentage of cases demanded operative treatment, and for these mechanical treatment was as essential as for the cases not operated upon. This mechanical treatment fell into three general classes—namely, plaster-of-Paris, splints (long and short); metal splints for immobilization (of which the Thomas splint was the best type); traction devices for use in bed and for walking (of which the Taylor splint was typical). Some cases required treatment in bed for a time; other cases might walk with crutches or the protecting traction splint; other cases—at least during the period of convalescence—might with advantage walk on the limb without crutches or any protecting device.

Professor Vulpius (Heidelberg) also spoke in English, and referred to the sun treatment carried out in Switzerland. If high altitudes were essential for this treatment

a great difficulty would arise, but fortunately they were not. There were quite enough ultra-violet rays in the sunshine of the plains to be efficacious, as was shown by pigmentation of the skin, which apparently was closely associated with cure. He described an establishment which he had opened one and a half years ago in a comparatively low situation. A combination of all useful methods was here used, including salt-laden air, which was artificially produced. Ultra-violet rays from quartz lamps, etc., were used when sunlight was not available. Some operations were still needful, and he believed that when tuberculous foci were demonstrated, their removal hastened cure.

Dr. Ménard (Berck-sur-Mer), said that cases treated at an early stage were curable with nearly normal movement and form, and he showed on the screen photographs of such cases. The ambulant treatment led to ankylosis in many cases. In hip disease the enlargement of the acetabulum was not due to pressure alone, for the *x* rays showed that it enlarged downwards as well as upwards, with deepening of the cavity.

Dr. F. H. Albee (New York) read a paper on bone transplantation in the treatment of Pott's disease of the spine and certain other deforming affections, which was illustrated by the lantern. He agreed in the main as to treatment with Professor Vulpius. He had treated 175 cases of various deformities by bone grafts. Of these 145 were cases of Pott's disease. The remainder included club-foot, ununited fractures, and fractured spine. The usefulness of bone grafts was already proved, no matter whether the graft itself lived in its new place or merely formed a mould for new bone. Animal experimentation had shown that the graft lost its identity and became indistinguishable at its borders from the indigenous bone in about four months. He always removed the periosteum with the bone, for although his experiments as to the bone-forming powers of periosteum were negative, he gave it the benefit of the doubt. On the screen he showed the method of removing the graft from the tibia, going deep enough to reach cancellous tissue and bone marrow, and the technique of its application to the split spinous processes. If there were much deformity it might be necessary to cut a number of notches two-thirds of the way through the graft, on its concavity, so as to allow of its bending. The ligaments should not be separated from the spinous processes, but the supraspinous and interspinous ligaments should be divided in the middle line. They and the muscular aponeurosis were afterwards united over the graft with medium kangaroo tendon or catgut. He believed that function stimulated the growth of the bone, and, therefore, he allowed early movement. No mechanical support was to be used, but after lying supine for six or seven weeks the patient was allowed to get about. Age was of no importance. The ages of his 145 cases ranged from 2 months to 60 years. The tibiae after the operation had given no trouble. In one case of severe almost angular lateral curvature from infantile paralysis he had used a lateral graft. In a case of dropped wrist from extensor paralysis, in which the flexor muscles were active, he had applied a bone graft, reaching from the radius to the trapezium and trapezoid, thus giving the patient a fixed point for the action of the flexors of the fingers. In the older cases of congenital club-foot he removed a wedge from the cuboid, etc., and transplanted it into a gap made by splitting the scaphoid and stretching out the foot, thus preventing the foot from falling back into varus. For the equinus deformity he removed a wedge from the tibia, and inserted it into a gap made by splitting the astragalus from behind and inserting the wedge in the gap. He did not find that the results of Lane's plates in the treatment of ununited fractures were good, but bone grafts had given him good results in the leg and thigh and the neck of the femur. The sclerosed tissue should be cut away, and a long mortice cut in the bone ends for the reception of the graft from the tibia of the other leg, or cold storage bone could be used. He had used an astragalus from a patient 18 years old to form a new caput femoris for a boy of 5 years old, and fixed it with a bone peg, securing ultimately two-thirds of the normal range of motion of the joint.

Dr. Rollier (Leysin, Switzerland) read a report on the sun cure for surgical cases of tuberculosis and its clinical results, illustrated by photographs. Great improvement appeared to have occurred in some cases, He summed up his paper by the statements that "a radiographical cure [that is, a cure proved by *x*-ray pictures] is the rule in all cases of closed tuberculosis; it is very frequent in cases of open tuberculosis. The synovial forms heal without leaving traces. Where the articulation is seriously affected one often obtains an integral cure with an ideal functional result, whilst remains of destroyed articulations can still occasion 'ne-arthrosis' with an equally unhoped for return of articular function." Whatever may be the final verdict upon the heliotherapeutical establishment at Leysin, the photographs of patients ski-ing naked on the snow strongly suggest the warming power of the sun at high altitudes and the Arcadian simplicity of Switzerland.

Dr. Torrance Rugh, while heartily approving of Albee's operation for Pott's disease, which he had performed a number of times, explained that when in discussing club-foot at a former session of the Subsection he had described a bone-grafting operation he did not know that Dr. Albee had already performed similar ones, and he was most anxious lest it should be thought that he had been guilty of stealing Dr. Albee's thunder. All his results had been good, but he had had one or two mishaps. In one case an unruly patient broke the tibia from which the graft had been taken by getting out of bed on to it. In another case a graft at the sacro-lumbar junction had broken. The end results in both cases were good. Dr. Rugh thought that this operation was the last word in the treatment of Pott's disease. It made a dependent individual independent in six months to a year, whereas the duration of the disease under other treatment was from five to ten years.

Dr. César Roux (Nice) read a paper on heliotherapy in surgical tuberculosis associated with other means of treatment.

Dr. Louis Mercière (Rheims) said that he was convinced that cases of joint tuberculosis in children and adolescents were not cured by the classical treatment of immobilization. As soon as the diagnosis was made, he began a local "precocious" treatment by intra-articular and periarticular injections of iodoform in ether, to which, when the bones were affected, he added boring into the epiphyses subcutaneously and injection of carbolic acid, a method introduced by him in 1901. Fresh air and sunlight were useful, but only local treatment was efficacious. The orthopaedic treatment of coxalgia and white swelling in children included besides local treatment the use of rigid appliances, afterwards articulated, and, lastly, mobilization of the joint, applied with prudence and discretion.

Dr. Calot (Berck-sur-Mer) insisted upon the importance of an early diagnosis of tuberculous lesions. A quarter of a century's experience at Berck enabled him to say that cure was certain if the tuberculosis was closed and restoration to normal (*guérison intègrale*) if diagnosis was early and treatment immediate. "To open a tuberculous lesion was to open the door to death." No violent corrections of deformity were permissible. The treatment of suppurating lesions was aspiration and injection; for dry and fungous tuberculosis sclerosing injections, followed by aspirations in serious cases. The statistics at Berck now were twenty times better than those of twenty-five years ago, when nearly all cases were operated on. They now had an average of cures of 98 to 99 per cent.

INDEPENDENT PAPERS.

Nerve Grafting.

Mr. A. H. Tubby read a paper on nerve grafting in certain cases of paralysis. In birth palsy from injury of the brachial plexus he had encouraging results. In the case of the popliteal nerve they were not so good, but the deformity of the foot should be completely corrected before any nerve operation was undertaken. He described various cases of injury of nerves in which he had performed neurorrhaphy or freed nerves from scar tissue. Lesions of the brachial plexus, if traumatic and if operated upon not later than four years after the injury, were the most hopeful. After that time the results were disappointing. Neuroplasty of the popliteal nerves was also not very satisfactory. In all cases of paralysis from the pressure of scar tissue on a nerve it was worth while to operate however hopeless the case might seem to be.

Operative Treatment of Paralytic Talipes.

Dr. Royal Whitman (New York) described the operation for paralytic talipes calcaneo-valgus which he had introduced in 1901. He alluded briefly to the anatomy of the foot and ankle, and emphasized the importance of the astragalus in deformities of the foot. Removal of this bone and displacement of the foot backwards upon the leg were the chief features of the proceeding. He had now given up the removal of cartilage with a view to producing arthrodesis, which he had formerly recommended and practised. No apparatus other than a gypsum bandage was worn after the operation. This proceeding, or a modification of it, was also useful for talipes equinus, or flail foot, and tuberculosis of the ankle. He laid down the rule that the foot should always be displaced backwards whenever the astragalus was removed for any reason whatever.

Dr. P. Desfosses (Paris) contributed a paper on the operative treatment of paralytic club-foot, in which he recommended arthrodesis of the ankle and of all three subastragaloid joints, combined with tenotomy if necessary.

Dr. Murk Jansen (Leyden) preferred to Whitman's operation transfer of the tendons of the toe flexors as well as the peronei to the os calcis in order to restore muscle balance. The deformity of the sole was first to be corrected by an apparatus which he described.

Dr. Chad Woodward and Dr. Baer both highly praised Whitman's operation.

Flaccid Palsy of the Upper Limb.

Dr. Louis Mercière dealt with the surgical and orthopaedic treatment of flaccid palsy of the upper limb, illustrating his remarks with drawings and diagrams. The proceeding which he had introduced in 1908 consisted essentially in using a graft of the pectoralis major and of the trapezius in place of the paralysed deltoid. He also described his grafting operations in the wrist and fingers and thumb.

VULNERABILITY OF FAST-GROWING CELLS.

At the last meeting of the Subsection on Saturday afternoon Dr. Murk Jansen (Leyden) read a paper on the vulnerability of fast-growing cells and rickets. Referring to the way in which the fast-growing cells of some morbid growths were alone affected by the x rays, he said that in the skeleton the interstitial cells were most easily affected. He drew a phylogenetic analogy between the growing point of a bud of a plant and the growing tissues of the embryo, and said that achondroplasia was the result of too great enfolding of the embryo and consequent ischaemia affecting the more vulnerable cartilage cells.

PROPOSED INTERNATIONAL ASSOCIATION OF ORTHOPAEDIC SURGERY.

The President reported the proceedings of the Committee appointed to consider the question of forming an International Association of Orthopaedic Surgery. It was unanimously resolved to adopt the report, and to ask the Committee to continue its labours and and to formulate a scheme for the organization of the Association.

ANAESTHESIA, GENERAL AND LOCAL.

POST-OPERATIVE EFFECTS AND TOXAEMIAS ASSOCIATED WITH ANAESTHETICS.

ON Monday, August 11th, the attendance was somewhat small compared with previous days, but the subject for discussion—the post-operative effects and toxaemias associated with anaesthetics—was interesting and brought forth some divergence of opinion.

Dr. William Hunter, the reporter, laid down the following proposition: Portal blood was poisonous, and if diverted directly into the systemic blood stream produced the same effects as those under discussion. The healthy liver cells purified it; the effect of anaesthetics, more especially chloroform, was to cause fatty degeneration of these cells; this was brought about by a process of self-digestion; oxygen, required for the due performance of their function, was normally obtained from stored glycogen; during a prolonged anaesthetization the supply of the latter, already depleted by the usual starvation methods preparatory to operation, was soon used up, and as it was not being contemporaneously renewed oxygen was obtained from the protein constituents of the cells; fatty acids were poured into the blood as a consequence, but were not themselves the cause of the symptoms, which were due to the impaired cells failing to purify the portal blood. Dr. Hunter illustrated his remarks by diagrams and lantern slides of microscopic sections of the liver and kidneys and heart, which were similarly affected. Anaesthetists, by their attention to the lungs and heart, had practically eliminated dangers from these sources, but they should remember that it was as important to conserve the functions of the liver during operations. In order to do this, glucose should be administered for twenty-four hours previously to operation up to within two or three hours of its taking place, thereby ensuring a large surplus of glycogen in the liver. In a series of cases investigated without glucose administration acetonuria was present in 25 per cent. before and 60 per cent. after operation; in patients previously fed on glucose for twenty-four hours acetonuria was present in 3 per cent. before and 22 per cent. after operation.

Dr. L. Guthrie agreed with Dr. Hunter that the symptoms were due to a general breakdown of the liver cells, and not simply fatty acid poisoning; but he did not think carbohydrate starvation was the only cause of breakdown. If this were so, these symptoms would be common, appearing in every case where carbohydrates were withheld for a short period; the symptoms were not present in children starving from pyloric obstruction. In fatal cases of acidosis the condition of the liver was peculiar so far as its macroscopical appearance went, differing entirely from the ordinary fatty liver.

His theoretical objections to the "carbohydrate starvation" theory were supported by the observations of Mr. E. Corner, who found that of a series of patients fed on glucose 32 per cent. developed acetonuria, whilst of a series not so fed 34 per cent. developed it, the difference being negligible; post-anaesthetic vomiting had been actually more common in the glucose-fed. Cyclical vomiting and post-anaesthetic vomiting were closely allied, and subjects of the former were extremely liable to the latter, the anaesthetic being the last straw in a person predisposed to these symptoms.

Mr. J. D. Mortimer (London), remarked that sickness and other after-effects, although often resulting from errors in selection and administration, were too commonly assumed to be due to the anaesthetic, so that other causes were overlooked and treatment ill-directed and inadequate. He had found, however, that vomiting was entirely absent in 60 per cent. of over 1,000 cases, excluding short administrations, and where considerable (2.5 per cent.) it could fairly be attributed chiefly to other causes. Sickness did not depend much on length of administration, but often on the nature and site of the operation. It was liable to occur especially after operations on the kidney, one reason probably being inhibition of the diaphragm allowing atonic distension, as it had been shown by Dr. Pasteur to favour pulmonary collapse. Better opportunities should be afforded to anaesthetists for investigation of patients when any after-complications occurred.

Dr. Frew said that his investigations at the Hospital for Sick Children, Great Ormond Street, satisfied him that acetonuria was far more frequent and occurred in a greater variety of cases than was thought. They also revealed the curious fact that whereas amongst medical out-patients only 2 per cent. had acetonuria, of 660 patients admitted into medical wards 400 had acetonuria in a few hours, increasing up to thirty-six hours and then decreasing. The diseases were various and the percentage distribution of acetonuria amongst them was equal. Assuming acetonuria to be dependent on carbohydrate starvation, he asked at what point did this occur. The diet supplied in the hospital was at least as rich in carbohydrates as that obtained outside. Was it in digestion, absorption, or assimilation that failure occurred? Some children were supplied from the time of admission with glucose; they seldom developed acetonuria and then only in a slight degree, showing that absorption and assimilation were normal. That left the indigestion of ordinary carbohydrate food as the cause. Children changed from mother's to cow's milk always developed temporary acetonuria.

The President was convinced that in routine practice sufficient attention was not given to detail. He distinguished between anaesthesia and anaesthetic toxaemia:

unnecessarily large doses of anaesthetics were a frequent cause of post-anaesthetic poisoning.

Dr. Hunter, in reply, pointed out that he was well aware of other factors; in many operations the liver was already partly *hors de combat* as the result of sepsis and toxic absorption. The length of administration was a factor; because operations were longer now the incidence of post-anaesthetic poisoning was greater than twenty-five years ago. He urged on surgeons the importance of wasting no time once the patient was anaesthetized; every minute saved was valuable.

Concluding Session.

Contrary to expectation, the attendance on the last day was better than the preceding one. The nature of the final discussion was such as to invite a review of the many methods advocated at the first and second days' sessions, and this doubtless stimulated the somewhat flagging enthusiasm of the members. Another factor was the adjournment of the discussion on open ether, reported on by Dr. Ferguson on the opening day, to this the last day. During the early part of the proceedings, in the unavoidable absence of the President, the chair was taken by Dr. Embley of Melbourne, and Dr. Carlo Oliva read a paper on variations of the adrenalin content in the suprarenal capsule following narcosis.

Discussion on the Selection of the Appropriate Agent and Method for producing Anaesthesia.

Dr. Silk, who replaced Dr. F. Dumont (Berne), having reviewed the work of many of the earlier speakers in the Section, especially endorsing Dr. Crile's pronouncement that the anaesthetist was not solely responsible for many of the troubles arising during or after operation, and usually attributed to him, Dr. Silk proceeded to expound his views on the matter of selection according to the type of the patient and the nature of the operation. Between the ages of 15 and 60 he was becoming more and more inclined to the use of alkaloids and open ether. He had a good word for the CE mixture, which had not as yet been mentioned at the proceedings, but which he was sure many used at the extremes of life and in a certain class of patient. He thought intratracheal ether had only a restricted field; he preferred chloroform to ether in the subjects of kidney disease; in heart disease, where there was compensation, the anaesthetic chosen was of no consequence, but in bad cases he thought it unwise to excite the heart's action by ether. He did not share Dr. Buxton's enthusiasm for the Vernon Harcourt inhaler; as a teacher he thought it best to instruct students, the majority of whom would be general practitioners, in methods which they could fairly be expected to adopt in practice. In operations on tonsils and adenoids he protested strongly against a simple gas anaesthesia, which generally terminated in an unseemly scramble between patient, surgeon, and anaesthetist, and for which the latter got the blame. In big operations about the mouth and in thyrotomies he liked the intravenous method, using ether, and strongly objected to the use of hedonal. After accidents to the lower limbs he thought spinal analgesia was valuable; in a general way, however, he deprecated its use in women and children, especially in private practice. With regard to the modern craze for complicated and cumbersome apparatus, he thought such was unsuitable in this country; on the Continent and in America all patients were operated on in hospital, but this condition did not obtain here so far as private practice went. After all, the personality of the administrator remained the dominant factor, and it was to his judgement and skill that the successful administration was due.

Dr. Ferguson (New Jersey) dwelt on the importance of the personal factor, and deprecated dependence on apparatus. Dr. V. Fielden was surprised Dr. Silk made no mention of ethyl chloride, which was the anaesthetic for short operations such as those on tonsils and adenoids.

Dr. Beresford Kingsford thought the Vernon Harcourt inhaler useful in the early training of students, as they were able to concentrate their whole attention on the signs and symptoms of normal chloroform anaesthesia; having acquired a thorough familiarity with these they could easily learn the drop method afterwards. In his opinion—and he had used it very largely in the past—ethyl chloride did not give sufficiently long an anaesthesia for the tonsil enucleations now in vogue.

Dr. Lloyd thought much of the new apparatus was the outcome of the impatience of the younger men, who were not content to wait till prolonged experience had given them the complete mastery of the simple and older methods which was essential to success.

Dr. G. A. H. Barton described his method of choice for routine work, which was applicable to 90 per cent. of all general surgery; his practice was alkaloids, a rapid induction with CE—ethyl chloride on a mask, followed by ether administered in a special inhaler which he described; he called it "open ether" (quite wrongly he was told), but at any rate it was as much an open method as that introduced from America. Professor Hobday spoke on methods adopted in veterinary surgery. Dr. Silk replied.

Open Ether.

The adjourned discussion on "open ether" was then taken. Dr. Gwathmey (New York) had a few words to say as to the safety of the continuous drop method. He had examined the mortality statistics of 400,000 anaesthetic administrations collected from American hospitals; contrary to expectation, the death-rate, compared with that of other anaesthetics, was high—higher than that of CE and of chloroform with oxygen. He compared some blood-pressure findings of Crile, showing the influence of trauma during the administration of anaesthetics. Under the drop method this fell; not so under nitrous oxide and oxygen, nor under ether given dosimetrically by means of an apparatus which he showed.

Dr. V. Fielden thought the amount of ether used in the drop method a drawback.

Dr. McCardie thought induction by this method too slow; he hastened it with ethyl chloride. There was danger in small rooms with an open fire.

Dr. Scharlieb had found open ether quite satisfactory in young children; he administered from Junker's apparatus, the bottle standing in warm water.

Dr. Foy (Dublin) remembered that in the days before he was qualified ether was always given on a cone and sponge inhaler; for his own part, he had given chloroform all his life without an accident.

Mrs. Dickinson Berry preferred to use open ether from the start; patients did not complain, soon lost consciousness, and in seven minutes were in a condition of surgical anaesthesia.

Dr. Barton said the apparatus he had previously described was dosimetric, and allowed of six different strengths being administered. In an hour's operation it did not use more than four ounces of ether, which could not be said of the drop method as practised in this country with chemically pure ether. Since using it he had never seen shock, no matter how severe or prolonged the operation, and the ward sisters told him that post-anaesthetic effects were practically abolished.

Dr. Lloyd advocated the use of Clover's inhaler without a bag, and Dr. Orr recommended open ether for children.

The President pointed out that Dr. Gwathmey's method was a further development of the "two-bottle" system of Dr. Tyrrel. Most methods described were not really open; it was doubtful whether surgical anaesthesia could be obtained by a strictly open method; it was not suitable for induction, but rather for the maintenance of anaesthesia. The importance of the CO_2 content should not be forgotten; under light ether narcosis, acapnia was likely to occur. He induced with gas and ether, or, if a previous alkaloidal injection had been given, with chloroform. In conclusion, he thanked all those who had helped to make the Section a success; he thought the excellence of the work done amply justified the formation of this Section, and trusted that anaesthesia would always be represented in future medical congresses. Dr. Ferguson, in reply, laid down the fundamental conditions of an open ether administration; these were not met by many methods described. He could induce by the drop method in four and a half minutes, and used no alkaloids. After Dr. Arrias, Mr. Hobday demonstrated an apparatus for administering chloroform to animals. It was safe, dosimetric, portable, and working automatically was well within the competence of an intelligent groom.

Independent Papers.

Oil-Ether.

Dr. J. D. Gwathmey of New York then read a preliminary report on oil-ether administration, based on laboratory work and a few trials in the human subject. The method consisted in pouring slowly into the rectum through a funnel and rubber catheter a solution of ether in oil; a previous dose of morphine was necessary; he preferred a suppository containing 1 grain and administered one hour beforehand. He used either olive oil or Carron oil, the latter giving up its ether more readily. Less than 60 per cent. of ether in the solution failed to produce anaesthesia, more than 75 per cent. caused irritation. Between 200 c.cm. and 300 c.cm. were injected, producing anaesthesia in ten to fifteen minutes, which lasted from three-quarters of an hour to an hour.

The President thought the method offered some advantages where rectal anaesthesia was desirable, and Professor Teter said he intended to adopt this method as an adjunct to gas and oxygen where such was required.

Ethyl Chloride.

Dr. E. Caillaud (Monte Carlo) read a paper on prolonged general anaesthesia by ethyl chloride, and exhibited an apparatus by which he administered this anaesthetic in regulated doses either alone or in conjunction with chloroform.

Dropper.

In the afternoon, when Dr. Silk was in the chair, Dr. Arrias (The Hague) exhibited a little contrivance for dropping ether and chloroform, separately or together, and in proportions varied at will.

OBSTETRICS AND GYNAECOLOGY.

Post-abortal and Post-partum Infection.

Several papers were read at a short session on Saturday. Professor Polak (New York) communicated his views on the management of the interior of the uterus in post-abortal and *post-partum* infection. Nature, he said, closed the uterine sinuses by the formation of blood clot; this was a conservative and protective process. A study of nearly 2,000 cases of infection had demonstrated that the endometrium should never be curetted in streptococcic infection, and that to curette the placental site was to court septic thrombo-phlebitis. When the inside of the uterus was not disturbed, there was little tendency for the infection to spread to the parametrium or peritoneum. Further, when the invasion of the lymphatics or blood channels occurred through a tear in the cervix, intrauterine treatment was obviously useless. He had found streptococcus in pure culture in from 30 to 40 per cent. of cases, and in mixed culture in from 60 to 70 per cent. The obstetric wound at the placental site should be regarded like a wound in any other place. The protective granulation zone should at all times be carefully preserved. It was well known that the danger from a curette increased as the period of pregnancy advanced, and no one present had ever curetted a septic uterus without witnessing an immediate rise in temperature. The essentials of treatment were (1) the promotion of drainage, (2) the stimulation of uterine contraction, and (3) the preservation of the protective granulation tissue. The speaker narrated the excellent results that had followed his adoption of this technique.

Indications for Inducing Premature Labour.

Dr. Tuszkai (Budapest) enlarged on the indications for inducing premature labour in cases of excessive vomiting and of heart disease. He commented upon the great difficulty of treating such cases, and briefly mentioned the various theories accounting for hyperemesis. He would not interrupt the pregnancy in this latter condition unless albumen appeared in the urine, the pulse-rate increased, and there was a rapid loss of weight and diminution of the chlorides in the urine. In several cases of pregnant women suffering from heart disease he had found that, when want of compensation began, the variation in the pulse, which had previously disappeared owing to the cardiac hypertrophy of pregnancy, reappeared again as a sign of subsequent dilatation. Induction of labour was less commonly necessary for these cases than many seemed to think.

Plastic Treatment of Malformations.

Professor Munro Kerr (Glasgow) created interest by his careful summary of plastic operative treatment for malformations of the uterus and vagina. He treated the conditions found under four headings: (1) Müllerian ducts fused; arrested development of the uterus. Cases were indicated where operation offered no hope of improvement, and thereafter various operations, mainly abdominal, for atresia of the cervix were described; excision was favoured. (2) Müllerian ducts fused; septum present. Excision of the septum from the vagina was recommended. (3) Müllerian ducts imperfectly fused. Where the depression at the fundus was deep (uterus cordiformis) the speaker recommended Strassmann's cuneiform excision by the abdominal route; it was rarely necessary to operate on uterus didelphys, but where complications appeared excision of the affected horn was advisable. (4) Vagina more particularly affected. Operations were rendered more satisfactory in difficult cases by a thorough exploration per abdomen.

A combined meeting with the Section of Radiology held on Monday morning for the discussion on Roentgen and radium therapy in gynaecology is reported on page 451.

Biochemical Function of the Endometrium.

At the afternoon session on Monday, Dr. J. Riddle Goffe, in a paper on the biochemical function of the endometrium in menorrhagia and metrorrhagia, confined himself to such cases as showed no pathological lesion on clinical examination. The haemorrhage from these cases showed delayed coagulation, and the generally accepted belief was that this deficiency of coagulating power was a local one, brought about by some factor, possibly an antithrombin, in the endometrial and subendometrial tissues. He had found that the blood from the uterine artery coagulated normally, but failed to do so when mixed with blood from the endometrial surface. There was no evidence of a lack of any essential for coagulation, but rather of the addition of an antithrombin. After referring to the close association now known to exist between the menstrual function and certain ductless glands, he suggested that ovarian and thyroid extracts should supersede the curette, ergot, and pituitary extracts. Rest in bed and firm packing of the vagina and uterus were advisable. In discussion, Miss McIlroy endorsed Dr. Goffe's remarks. She had found an excess of calcium salts in menstrual fluids, and emphasized the close association existing between the ovary and thyroid and the menstrual function. She hinted also at a syphilitic taint in some of these cases. Sir Francis Champneys considered that many cases of undue haemorrhage in young girls cured themselves. He strongly advocated swabbing the uterine cavity with fuming nitric acid in lieu of hysterectomy.

Vaginal Hysterectomy.

Dr. R. L. Dickinson (Brooklyn) narrated his simplified technique for vaginal hysterectomy. He advocated two catgut-suture ligatures instead of a tangle of interrupted ties. The two strands, one for each side, closed together the broad ligament and pulled it into view. Finally the two broad ligaments were sewn together and the peritoneum, bladder, and vagina attached to this strong bridge.

Cancer of the Uterus.

The last session of the Obstetrical Section was unfortunately rather poorly attended, and it was to be regretted that many of the foreign members who had indicated a desire to take part, and whose contributions were eagerly looked forward to, did not put in an appearance. The subject for discussion was on cancer of the uterus (cervix and body), its operative technique and results. A resolution of sympathy for Professor Wertheim on his recent accident was unanimously passed, and thereafter Dr. Weibel (Professor Wertheim's first assistant in Vienna) reported to the Section in his stead. Some recent modifications of his technique for the abdominal radical operation in cervical cancer were announced. The most important of these was the plugging of the vagina beforehand with gauze soaked in 5 per cent. silver nitrate solution. The peritoneum should be completely closed, and if resection of a ureter proved necessary and implantation into the bladder (or in some cases into the vagina or rectum) were impossible, excision of the

kidney was the best procedure. There had been no necrosis of the ureter in the last 214 cases. In all 714 cases were reported with a mortality of 16.6 per cent.; 186 were free from recurrence after five years, and of these 14 had shown invasion of the regional glands at the time of operation. These cures represented 53.3 per cent. of all cases after excluding primary and intercurrent mortality. His operability rate worked out at 50 per cent. He recommended the same operation for cancer of the body, for in these 14 per cent. showed gland invasion.

Professor Proust (Paris) advised a preliminary ligation of the internal iliac arteries, external to the ureter, and as high up as possible.

Dr. McCann (London) had used silver nitrate disinfection of the vagina for four years. He was against the curette as a preliminary step, and had not had a single case of infection of the abdominal wound. In 65 cases of cervical cancer he had only lost three patients. The first stage of the operation should be the separation of the bladder from the uterus. A subperitoneal gauze drain was advisable in cases where haemostasis was not absolute, but it should not be left in for more than forty-eight hours. He was strongly against any operation in the advanced cases, and favoured the complete operation for cancer of the body. In 28 of these cases he had had only one death.

Dr. Comyns Berkeley (London) considered that life-expectation should be held in mind as well as curability. Dr. Bonney and the speaker performed a very thorough operation, and did not exclude cases that many were disposed to leave alone. Their operability percentage was 63, their mortality 22.5, and, as evidence of the serious cases they accepted for operation, they found implication of the glands in 33 per cent.

Mr. Childe (Portsmouth) favoured clamp and cautery of the cut surfaces of parametrium and vagina; complete haemostasis was ensured, and ligatures were not necessary.

Demonstrations.

Professor Nagel (Berlin) demonstrated a beautifully injected puerperal uterus. The tortuous and convoluted branches of the uterine arteries were well seen. Conclusions as to the origin of the lower uterine segment were developed from the specimen.

Dr. W. R. Johnstone (Edinburgh) showed a cast and coloured photomicrographs of an early ovum which he believed to be a case of uniovular twins. The age was calculated at 15 days. The nature of a double layer of epithelium covering the vesicles was not quite clear. The lantern demonstration was much admired.

OPHTHALMOLOGY.

Affections of the Eye Produced by Undue Exposure to Light.

On Monday morning, when Sir Anderson Critchett was in the chair, a discussion on this subject was opened by Professor Carl von Hess (Würzburg). Ordinary daylight, he said, had no discoverable evil influence on the eyes either healthy or diseased, and the trouble in cases of photophobia in children was not caused by the cornea or iris, but by disorders which in themselves had nothing to do with photophobia. Prolonged exposure to sunlight, on the other hand, brought about conditions well known to occur during the watching of a solar eclipse, and also in the condition known as snow blindness. The first were produced by the long wave rays, and the latter by the short wave rays, of the spectrum, and they could both be prevented by suitable protecting glasses. The effects produced by lightning and short-circuiting of an electric current were caused chiefly by the ultra-violet rays, and it had been supposed, but not proved, that the same was the cause of glass-blowers' cataract. The fear that injury to the eyes was caused by modern sources of illumination was to a large extent groundless, and any discomfort could always be prevented by suitable shading of the lamps. Glasses for this were unnecessary except in the case of men who were working for hours together in artificial light rich in ultra-violet rays.

Mr. J. Herbert Parsons (London), after enumerating the various conditions of the eye which had been ascribed to too much or too little light, entered into the physics of light in some detail. Photophthalmia was due to undue exposure to sunlight, and one form had been called snow-blindness, but it could also be produced by the electric arc lamps, and, in fact, any light rich in ultra-violet rays. The milder ocular symptoms of a lightning stroke resembled those of short-circuiting, but the severer forms were generally characterized by the formation of a cataract, though these severer injuries were probably caused by concussion or electrolysis. Heat as well as light was probably concerned in the development of glass-blowers' cataract. Many cases of eclipse blindness following the act of gazing at the sun with the naked eye had been seen, and there were always a number of them after every solar eclipse. These cases showed retinitis, and a scotoma when produced was not always recovered from. He mentioned erythropsia or the red vision so frequently seen after cataract extraction or after the exposure of the eyes to snowfields.

Dr. F. W. Edridge-Green (London) gave a full explanation of erythropsia on his theory of vision which was capable of accounting for the phenomenon. It was a photochemical condition and due to the visual purple. He thought red a most irritating colour, and it was for this reason that some totally colour-blind people were able to become aware of it.

Mr. Bishop Harman (London) called attention to the great change which had taken place in recent years in the general science of illumination. Unprotected arc lamps, metal filament lamps, and high-pressure gas caused great retinal and cerebral fatigue. New lights of great intensity were put into old fittings and shades were used in 100-candle power lights which were designed for those of 8-candle power. It mattered little how intensely an object which was being examined was illuminated, but it was most detrimental for the intense glare from a highly luminous point to strike the eye in an unprotected manner. He thought it should be an offence to display in a public place a naked lamp above 20-candle power or any arc or equivalent lamp nearer than 30 ft. above the footpath.

Mr. Priestley Smith (Birmingham) discussed the question of photophobia in children, and Dr. George Mackay (Edinburgh) said that the acute pain caused by excessive light was muscular. He called attention to the fact that while one person was quite comfortable with a great glare of light, and found it difficult to read with any less, others could not stand anything like so much. He asked if any one had had experience of moon blindness, which was firmly believed in by seamen; he had never seen a case.

Dr. G. A. Berry (Edinburgh) expressed the belief that blepharospasm was due to light falling on a retina in a state of dark adaptability. For protecting glasses he preferred neutral tint to "euphos" glass.

Professor Axenfeld (Freiburg) thought that spring catarrh was really due to exposure to air rather than to light, and he adduced evidence in proof of this idea.

Colonel Elliot said that in India cyanopsia followed cataract extraction in about 60 per cent. of the cases, while black cataract was extremely common. After extraction the pigment of the retina was greatly diminished and he suggested the possibility of its having found its way into the lens. Glare-photophobia, which was so very common in India, was associated with an irritable condition of the conjunctiva at the fornix, and treatment for that, with silver nitrate or similar drugs, cured it. He thought that previous to a solar eclipse notice should be put into the papers warning people not to look at the sun without protecting glasses; damage was frequently caused in India from ignorance of this fact.

Dr. Bernard Cridland thought that ironworkers, that was to say those who had to work with the metal at a white heat, were just as liable to cataract as glass-blowers, It should, he suggested, be included among the trade diseases. In this he was supported by Dr. Brinton (South Africa).

Independent Papers.

Sight Tests for Seamen.

At the afternoon session, when Mr. Charles Higgins, Vice-President, was in the chair, Dr. Karl Grossmann (Liverpool) read a paper on the sight tests for sailors. He advocated the standard of ⅞ vision in each eye. He thought that a lantern was essential for testing for colour vision, and he also considered the Holmgren test particularly bad, while any defect in light perception

should be considered a bar to a candidate's employment as a seaman.

Mr. T. H. Bickerton (Liverpool) thought the whole matter should be dealt with from a practical point of view. He disagreed entirely with the finding of the Departmental Committee of the Board of Trade, and considered that a man with half normal vision was quite safe, though for new candidates a higher standard should be required. If a man could see a ship at a certain distance it was of far more importance than seeing what letter he could read on a board.

Dr. Edridge-Green (London) and Mr. Nettleship (London) also spoke.

Detection of Colour Blindness.

Dr. Edridge-Green read a paper on the detection of colour blindness from a practical point of view. He advocated his well-known tests for this purpose, and said that it was impossible for a man who was colour blind to pass his lantern test, and it was equally impossible for a skilled examiner to reject a normal sighted man. The Holmgren test was a very bad one, and was made still worse than it might be by the fact that colour names were not allowed to be used. He contended that it was absurd to conduct an examination for this purpose and not to use the names of colours. Since a lantern of what he considered to be of very imperfect construction had been used by the Board of Trade the percentage of rejections had gone up from 0.8 per cent. to 6.22 per cent.; not one candidate who could pass the lantern was rejected by the wools, but several who could pass the wools were proved to be dangerously colour blind by the lantern. No test ought to be relied upon which could be passed by the colour blind after coaching, and the wools and many other tests were not reliable after the candidate had once seen them. It was impossible for any one to be coached in the use of his lantern. A person might be an anomalous trichromatic and yet have perfect colour vision, while many colour blind people, even some dichromatics, made a normal equation with less deviation than the majority of normal sighted persons.

Mr. Nettleship defended the tests in use by the Board of Trade, and Dr. Berry (Edinburgh) said that he quite failed to follow Dr. Edridge-Green's theory, and thought the Holmgren test excellent.

Mr. Devereux Marshall (London) pointed out some inaccuracies in the nautical assumptions of some of the previous speakers. He thoroughly endorsed Dr. Edridge-Green's views, both from the theoretical as well as from the practical point of view. He could not understand any one failing to understand Dr. Edridge-Green's theory, for it not only explained all the known facts of colour vision, but also of vision of all sorts as well. No other theory was capable of explaining any of the facts.

Dr. Edridge-Green, in reply, stated that to show two lights in a lantern was harmful and unnecessary and did away with much that was useful in the lantern test. In one of the latest books on physiology his conclusions were mentioned not as a theory, but as fact.

The following resolution, proposed by Dr. Karl Grossmann (Liverpool) and seconded by Dr. F. W. Edridge-Green (London) was subsequently adopted:

1. That an international committee, with power to add to its number, be appointed by the council of this Section of the Congress to report on a suitable standard of form vision, colour vision, and light sense, in the interest of safety at sea.
2. That this committee also report on what it considers and recommends as suitable tests for carrying out the necessary examination of vision as mentioned above.

Radio-therapy and Light Treatment.

Professor W. Koster (Leyden) read a paper on the direct treatment of eye diseases with radium and mesothorium. These substances were contained in a small glass tube and directly applied to the diseased parts. He recommended the method in almost every disease to which the eye and the surrounding parts were subject. He considered that it had a great future before it, and was not dangerous in experienced hands.

Dr. Fritz Schanz (Dresden), who read a paper on light treatment in diseases of the eye, explained fully how he used the light, and mentioned some of the conditions in which he had found it beneficial.

Foreign Bodies.

Dr. Lauber (Vienna) gave an account of an operation for the extraction of foreign bodies from the eye which were either non-magnetic or so embedded that the magnet was not sufficiently powerful to withdraw them. The method was devised by Sachs. It consisted first of all in accurately localizing the foreign bodies by means of the x rays, and then making an incision through the coats of the eye as near to it as possible. The eye was transilluminated and the wound held open, and it was then usually possible to see, and to take hold of the body with forceps and withdraw it. If the media were clear it was quite easy to see exactly what was being done, and many excellent results with non-magnetic particles were recorded.

Other Papers.

Dr. Terrien (Paris) read a paper on the physiological mechanism of the coagulation of the aqueous humour, and Dr. J. Fejer (Budapest) described a case of temporary blindness due to ergot poisoning.

Infarction of Posterior Ciliary Arteries.

Mr. George Coats (London) read a paper on infarction of the posterior ciliary arteries, and showed microscopic sections illustrating the condition. The necrosis produced corresponded to the distribution of the affected arteries.

Astigmatism in Two Meridians.

Professor Marquez (Madrid) read a paper on astigmatism in two meridians corrected with two cylindrical glasses with oblique axes. Mr. Percival (Newcastle-on-Tyne) thought that Professor Marquez was to be much congratulated on the very fine piece of optical work.

Operative Treatment of Squint.

Mr. Bishop Harman (London) demonstrated his method of treating squinting eyes by means of taking a reef in the muscle and elongating the opposite muscle by its partial division. He presented the results of 100 cases which showed a very high standard of success. He illustrated the method both on a phantom and also by some very clear photographs. The advantages he claimed for it was that the results were very reliable, the muscle was not divided so that an over-effect was scarcely possible; while it was quite easy to shorten a muscle to the degree required, and it was never necessary to shorten it to anything like the extent that was possible. If too much shortening was produced on one muscle so as to cure a very marked squint it tended to make the eye assume a too deep position on the socket, and for this reason it was advisable to lengthen the opposite muscle. This could, of course, be done by doing a complete tenotomy, but he did not advise it owing to the uncertain effect produced. He showed that by means of a special pair of forceps and a knife three incisions might be so placed in the muscle that very considerable lengthening of it could be produced without actually dividing it. It was so often considered that a partial tenotomy was no more capable of lengthening a muscle than would the partial division of a piece of string. This, however, was not the case when done by his method. Photographs of some of his patients were shown, and he strongly recommended the operation on account of its simplicity, safety and success. Most of his cases had been operated upon as out-patients, but this was never desirable if other methods of advancement with division of the muscles were performed.

Dr. F. C. Todd (Minneapolis) said he had been working on similar lines to Mr. Harman for the last twelve years. The principle had this great advantage, that the results were permanent, and under no circumstances could they be made worse, for nothing was divided, so that if the whole thing failed they would only be left where they were; but this was, of course, practically impossible. He proposed to adopt many of the suggestions which Mr. Harman recommended. In reply to a question, Mr. Harman said that the reason the operation was done subconjunctivally was because it was easier, cleaner, and held better. Practically no lump remained after a very short time.

Prevention of Myopia.

Professor Levinsohn (Berlin) read a paper on short-sightedness, and strongly urged the necessity of outdoor

exercise and sports as a prophylactic against its development.

Mr. Percival pointed out the part taken by the superior and inferior oblique muscles in the pushing out the posterior pole of the eyeball. These muscles girdled the globe, and exerted considerable pressure in this direction.

Spring Catarrh.

Dr. A. Greene Brinton (Johannesburg) read a paper on the treatment of spring catarrh of the bulbar variety (not with radium). He considered that the term "vernal" or "spring" catarrh was applied to various forms of conjunctivitis. The ocular form, in which the conjunctiva of the globe was especially affected, and in which the conjunctiva became very swollen and "soggy," he designated "tonsillitic" conjunctivitis, for the reason that it was found to be always associated with tonsillar disease. In South Africa he had found that this form occurred at all seasons of the year, the only common cause being undue dampness of the atmosphere, which was the exciting factor in patients who were subjects of rhinitis and especially of enlargement of the tonsils, particularly the lower tonsillar lobe. All the usual local treatment he had found more or less useless until the tonsils were absolutely and completely enucleated, then the conjunctival trouble disappeared rapidly, sometimes in a few hours. He thought that this form of conjunctivitis was due not to bacterial infection but to lymphatic changes and possibly inflammation and obstruction of lymph channels, and believed the cure was due to the opening of lymph channels around the carotid sheath.

DISEASES OF CHILDREN.

Discussion on Infection of the Urinary Tract with Colon Bacilli.

Dr. John Thomson (Edinburgh), in opening the discussion, confined himself mainly to its clinical features, their value in diagnosis, and the light they might possibly throw on the pathology of the condition; he also discussed the course of the disease and its treatment, especially by drugs. His paper was founded mainly on personal observation of 71 cases of various types of *Bacillus coli* infection which had been under his care; 25 of these had already been considered in two former papers. He thought it was quite certain that they were carried from the colon to the urinary tract, sometimes by the blood stream, sometimes passed in by the lymphatic channels, and sometimes ascended from without by the urethra. He especially emphasized the great probability that the organisms often followed a combination of these paths. Thus they might pass from without through the short and wide female urethra directly into the bladder, thence through the mucous membrane into the lymphatics, and in them up the outer wall of the ureter until they reached the pelvis of the kidney. On the other hand, they might enter the blood or lymph stream through a rectal or intestinal excoriation and be taken straight to the kidney or pelvis, and from there might be washed down by the urine to the lower parts of the urinary tract. The normal colon bacillus seemed to have little pathogenic effect on healthy mucous membrane. If the virulence of the organisms had been increased by morbid processes in the intestine or otherwise, or the normal resistance of the tissues lowered by local or general disease, or, perhaps, if there had been some retardation of the flow of urine so that the bacilli had been retained abnormally long, then more or less violent inflammation with corresponding symptoms might be set up. Thus, in 32 out of his 71 cases the symptoms of urinary disease had set in during or shortly after some weakening disease or experience. In three-fourths of the cases in which this had been noted it was of the nature of a bowel disturbance. The disease might begin within the first few weeks of life, and was about twice as common in children under 2 as it was after that age. It was also generally more severe in younger children. The relative proportion of the two sexes affected and the way the clinical details differed in boys and girls were among the most striking features of this infection. The proportion of girls affected was much larger, and in his cases amounted to 79 per cent. In young infants the illness more often began with diarrhoea than in older children, and this symptom was more frequently marked in boys than in girls. During the first six months of life far more boys than girls were affected. Rigors and shiverings constituted an important symptom of this infection, contrasting with their infrequency in other infections in infants. They, however, were extremely rare at the onset of the symptoms in boys, and had not occurred in any of his 15 male cases. Mild cases of *B. coli* infection were rare in boys, and there were more cases of pyelonephritis among them than among girls. The significance of the clinical differences between the sexes was not quite clear. The great preponderance of female patients seemed to point to the conclusion that ascending infection must be a common occurrence. The greater prevalence of antecedent diarrhoea in boys would probably disappear if it were possible to subtract from the list of girls the cases infected by the urethra. The most frequent cases were those in which the parts above the bladder were invaded, and the striking peculiarity about their symptoms was the trivial and equivocal nature of the local manifestations, and the extreme severity of the general disturbance. The temperature chart was characteristically that of an infective disease. Nearly two-thirds of the female infants with symptoms of acute pyelitis were said to have had a well-marked rigor or shivering fit about the time of onset of their illness. Several also had repeated rigors during the first few days of treatment. In 3 or 4 cases "faint turns" were described, in which the patient became pale, rigid, and semi-unconscious. Like the rigors, these peculiar attacks were very characteristic of the disease in babies. The extreme misery, restlessness, and general tenderness when the temperature rose formed a valuable and important diagnostic sign. The first indication in treatment was always to ensure a free discharge of urine by giving the child large quantities of fluid to drink. Occasionally, when the patient refused to drink enough the fluid had to be administered through a stomach tube or by the rectum. A second indication was to see that the bowels moved adequately, for which he employed sodium phosphate. The other important forms of treatment were: (1) The alkalinization of the urine, (2) the administration of antiseptics, and (3) the use of serums and vaccines. The first of these methods by the use of potassium citrate or some other alkali was the form of treatment which he had found most effectual. The aim was to keep the urine alkaline for a week or two after the pus had disappeared and the symptoms had ceased. The dose of potassium citrate varied considerably. The smallest amount which he had found successful was 24 grains in the day, but generally it was advisable to begin with 60 grains if the patient was under 2 years old, and it was often necessary to give double this amount, and occasionally 150 grains.

The value of vaccine therapy by means of autogenous vaccines was attested by Dr. Gorter (Leyden), who had treated 18 cases in this way, only one of which was a simple case of pyelitis. Five were cases of chronic bacilluria; in 8 others there were frequent relapses, and in the remaining 5 severe complications were present. The effect of the vaccines was gauged by estimating the number of pus cells in the urine; 13 out of the 18 recovered, 1 died of bronchopneumonia, 2 did not improve, 2 did not recover but improved considerably. The number of bacilli injected varied from 10 million to 700 million.

Dr. Waller (London) called attention to the presence of bacilli in the urine in cases of oedema following enteritis in children. He had examined 11 male and 14 female children who showed this association. It seemed possible that in cases of diarrhoeal disturbance the presence in the urinary tract of *Bacillus coli communis* was by no means uncommon.

Dr. Ross related the results of the bacteriological examination in Dr. Waller's cases. The two organisms commonly found were the *Bacillus coli communis* and the *Bacillus proteus*.

Dr. Kerley (New York) spoke of the persistence of pus in the urine in this infection, in spite of the disappearance of fever, and in spite of alkaline or vaccine treatment. He was doubtful whether treatment did much good.

Dr. Butterworth (U.S.A.), Dr. Lapage (Manchester), and Dr. Sedgwick (Minneapolis, U.S.A.) continued the discussion, and Dr. Thomson replied.

DISCUSSION ON POLIOENCEPHALITIS AND POLIOMYELITIS.

Dr. F. E. Batten (London), in introducing this subject, pointed out that since the last International Congress of Medicine in 1909 great additions had been made to the knowledge of these diseases. It was true that in December, 1908, Landsteiner and Popper had succeeded in communicating poliomyelitis from human being to monkey, but all the knowledge now possessed concerning the nature of the virus had been furnished since by the experimental work of Landsteiner and Levaditi, Flexner and Lewis, Leiner and Wiesner, Roemer and Joseph. In 1909 Knöpfelmacher produced the disease in a monkey by injecting into the peritoneum an emulsion of the spinal cord from a case of poliomyelitis, and in the same year this experiment was repeated by Strauss and Hontoon in America. Towards the end of 1909 there came the communications, almost simultaneously, of Flexner and Lewis, Landsteiner and Levaditi, Leiner and Wiesner, and Roemer, showing that the infection could be transferred from monkey to monkey by an emulsion of the spinal cord. It was shown that the virus was filterable and would pass through the usual filters, but that after such a passage it lost some of its virulence, and the incubation period was always prolonged. It was also shown that the virus might be preserved for many months in pure glycerine, or 50 per cent. of glycerine in water, without affecting its virulence. In this respect the virus resembled that of rabies and vaccinia. The organism would withstand prolonged drying, so that material dried at 22° C. for twenty-four days was still virulent. The cultivation of the organism had up to the present not been definitely accomplished. Small round and oval corpuscles had been described under the ultra-microscope, and quite recently Flexner and Noguchi had described a medium and method of growth under anaërobic conditions. They described minute colonies of globular bodies averaging 0.15 to 0.3 of a micron in size. These bodies stained a pale reddish-violet in Giemsa solution. Monkeys inoculated with the cultures had developed typical poliomyelitis, but the authors were fully aware of the possibility of the carrying over of a quantity of the original virus sufficient to cause paralysis in the inoculated monkeys, and further experiments were in progress to prevent such an occurrence. Experimentally it was found that the most certain method of infecting monkeys was by injecting 0.5 c.cm. of an emulsion of an infected spinal cord into the brain, and at the same time 4 to 5 c.cm. into the peritoneal cavity. Subcutaneous and intravenous injections were, however, frequently successful. The virus would pass through the uninjured nasal mucous membrane and would also penetrate the intestinal mucous membrane. Shortly, it might be said that the virus existed in the central nervous system, in the mucous membrane of the nose, in the tissue of the pharynx, in the lymphatic glands, rarely in the salivary glands, and still more rarely in the blood; but it could not be proved to be present in the buccal, pharyngeal or nasal secretions or in the faeces. The great epidemic of poliomyelitis in Sweden in 1911 gave the observers Kling, Pettersson, and Wernstedt the opportunity of a thorough investigation. With regard to infection by fomites, Dr. Batten said that Josefson had succeeded in producing experimental poliomyelitis with a handkerchief and fancy work, and Neustaedter and Thro, after many failures, produced the disease in a monkey with a filtrate of macerated dust collected from infected rooms. Howard and Clark showed that the domestic fly could carry the virus and that the bed-bug had taken the virus with the blood from infected monkeys and maintained it in a living state within the body for a period of seven days. It had also been demonstrated that the disease could be transmitted from monkey to monkey by the stable fly. Dealing with the clinical manifestations of poliomyelitis and polioencephalitis in man, he said there were several forms: (1) The spinal type; (2) the ascending and descending, so-called Landry type; (3) the bulbar and pontine type; (4) the encephalitic type; (5) the ataxic type; (6) the neurotic type; (7) the meningeal type, and (8) the abortive type. Certain of these were not commonly recognized. One which was little known was the "Jump" type, in which the disease remained stationary for several days, and then rather suddenly and rapidly advanced. The bulbar type also not infrequently escaped recognition. The clinical picture was very striking, and, apart from poliomyelitis, was only seen in deaths from myasthenia gravis and probably in rabies. There was some question as to the presence of a neuritic type of the disease, and although at the present time it could not be asserted that toxic polyneuritis had been proved to be a manifestation of the virus of poliomyelitis, he thought that there was reasonable ground for considering that it might sometimes be the case. He then dealt with the incidence of poliomyelitis in London. There was no doubt that it had been endemic in London for many years. He exhibited charts showing that it was fairly evenly distributed over the country. England had never suffered from a severe epidemic, but from sporadic cases scattered over the whole country. The incidence of the disease in 1911 was unusually severe. In conclusion, he said that poliomyelitis and encephalitis must be regarded as an acute specific fever, having an incubation period which was variable, but on the average from eight to twelve days. The virus was carried in the mucous membrane of the mouth, nose, and pharynx, not only of those who had the disease, but also of those who had only been in contact with the infected. The disease might infect any part of the nervous system, but fell with greatest severity on the grey matter of the ventral horns of the spinal cord. The clinical symptoms were variable, depending on the incidence of the virus on the nervous system. This might either give rise to infiltration of the tissues and vessel walls with cells of a lymphocytic nature or act as a direct poison to the neuron. The form which the affection took depended to a great extent on the virulence.

Professor Netter (Paris) spoke of the meningeal form of poliomyelitis, emphasizing the fact that it was extremely difficult to distinguish from cerebro-spinal fever, and sometimes impossible.

Sir Thomas Barlow said that he had come to the conclusion some years ago that the infection was connected with infective catarrhal conditions. He referred to evanescent forms of the paralysis and cases in which the paralysis was scarcely noticeable. He argued that the meningeal form was very difficult to distinguish from cerebro-spinal meningitis, but thought that the head retraction was less and the subsequent paralysis more than in that disease. In cerebro-spinal meningitis, too, there was usually some spasticity at some time during its course. There was much to be said for recognizing neuritis as part of the disease. It was extremely important in the early stages to keep the children in bed in order to limit the output of nervous energy and reserve the strength of the child in the greatest degree possible. He disapproved of massage, electrical and allied treatments, before all pain and tenderness had quite gone.

Dr. Lovett (New York), Dr. Butterworth (New York), Dr. Gossage, Dr. Guthrie, and Dr. Kerley and Dr. Fischer (both of New York) also contributed to the discussion.

NEURO-PATHOLOGY.

DISCUSSION ON MOTOR APHASIA, ANARTHRIA, AND APRAXIA.

UNFORTUNATELY Professor Dejerine of Paris was unable to attend on account of illness, but Dr. Jumentié read a summary of his report to the Section. It contained a general historical survey of theories, proved and unproved, on these important questions. The writer, after reference to the work of Broca, Marie, and others, dealt first with the history of motor aphasia, or aphemia, and the contradictory views which prevailed regarding this disorder until the work of Pierre Marie crystallized them in some measure. Then followed an account of the vicissitudes of the term "anarthria," which, to begin with, had a precise meaning, but in time became modified sufficiently to express quite an opposite meaning. In 1908, indeed, the Neurological Society of Paris declined to accept the term "anarthria" as indicating difficulties of the spoken word in motor aphasia and substituted for it the term "aphemia." Professor Dejerine then dealt with the clinical distinctions between aphasia and anarthria, and discussed in some detail the pathological anatomy of the subject. Anatomically, anarthria or dysarthria could be caused by bulbar lesions, cortical lesions, or lesions of the cortico-bulbar fasciculus. The term "anarthria" ought to be kept, but should be reserved for disorders of speech of motor origin, characterized by spasm, or paralysis of co-ordination. Aphasia, according to Lantzenberg, was verbal in character

anarthria purely vocal. The intrinsic part played by the lenticular nucleus in the production of anarthria, seemed to be negative. The doctrine of aphasia as enunciated by Broca and Wernicke was still a classic.

Professor Liepmann (Berlin), who had a hearty reception, plunged at once into his subject. Aphasia—not only motor aphasia, but every expressive-aphasic disturbance of speech—and apraxia were, he considered, essentially similar. The enlarged conception of apraxia was not limited to visible effects of movement. Very clearly and explicitly he distinguished apraxia from other disturbances of movement—for example, paralysis, or ataxia. Man was born with an executive apparatus—sensory and motor. If the former was impaired, ataxia, and possibly athetotic and choreiform movements, followed; if the latter, paresis. But this apparatus did not suffice for the functions of life. By imitation and instruction something new was added to the mere possession of a healthy executive apparatus. If this acquired capacity was lost or impaired, apraxia or dyspraxia ensued. Physiologically and psychologically, and therefore also pathologically, the expressive-aphasic disturbances belonged in principle to apraxia—using that word in the wider sense. By regarding motor aphasia as an apraxia the demarcation from anarthria was established. To French investigators was due the knowledge that the major share of the function of speech belonged to the left hemisphere. Liepmann's own investigations had shown that the left hemisphere preponderated in nearly the same measure for praxia as a whole. The want of independence of the right hemisphere showed itself particularly by its inability to initiate movements without handling an object. In many left-handed dyspractic patients movements involving the handling of objects were quite possible, but they failed completely to imitate movements made before them. The right hemisphere was dependent on the left hemisphere for the execution of these "free" movements.

An animated discussion followed, in the course of which von Monakow exhibited, by the aid of the lantern, a number of macroscopic sections of the cerebrum affected by tumours, which went to prove the argument he advanced that apraxia can be caused by lesions in almost any position.

Claude, Wilson, Gutzmann, Rothmann, and Heveroch all contributed something of interest to a valuable morning's work.

Discussion on the Myopathies.

The subject for discussion on Saturday—the relation of the myopathies—was introduced by Dr. Spiller (Philadelphia). The classification of the myopathies was, he said, no easy task; but there were two great groups of muscular atrophy or arrest: (1) The congenital; (2) the acquired. The first of these embraced the cases of arrested growth in certain limited regions of the body—for example, the infantile nuclear arrest of Möbius. This condition might be caused by muscular defects with complete integrity of the nerve apparatus, or, on the other hand, the peripheral neurones might be much affected. This congenital arrest was not usually progressive. Acquired muscular atrophy also presented two types—the primarily muscular, with intact nervous system, and the nuclear (neuronic), in which the nerve cells of the peripheral neurones were implicated. In the former were included progressive muscular atrophy including the bulbar form of Hoffmann; in the latter the Werdnig-Hoffmann muscular atrophy, the infantile bulbar atrophy of Fazio, Charcot, and Londe, and the forms of myelopathy occurring later than the period of childhood. These types were progressive, and the various types were combined in rare cases. He accepted Batten's classification of the myopathies as an excellent basis for discussion. The simple atrophic type of Batten was most in dispute. It was congenital or begun in early infancy, and was characterized by smallness, lack of power, and loss of tone in all the muscles of the body without localized atrophy or hypertrophy of individual muscles or groups of muscles. The disease was slowly progressive. With this type Batten had combined amyotonia congenita, and there were unquestionably many points of resemblance. Collier and Wilson, however, had formulated many points of distinction. Spiller then discussed the differential diagnosis between myopathy and amyotonia in detail. The most important distinction of amyotonia was that it was non-progressive, and that amelioration might occur. He then reviewed the distinctions between amyotonia and the Werdnig-Hoffmann atrophy as advanced by various authorities. These were not so definite and pronounced as some authors would suggest. He then discussed the distal type of myopathy, myotonia atrophica, and hypertrophia musculorum vera—the latter a somewhat neglected condition—and mentioned cases illustrative of the different types.

Dr. F. E. Batten (London) said that his classification of the myopathies was as follows:

1. The simple atrophic type (amyotonia congenita).
2. The pseudo-hypertrophic type.
3. The juvenile type (Erb).
4. The facio-scapulo-humeral type (Landouzy).
5. The distal type (Gowers).
6. The myotonia atrophica type.
7. Mixed and transitional types.
8. The true hypertrophic type.

He then discussed amyotonia congenita in relation to the simple atrophic type of myopathy. A feature of the former was an extreme state of hypotonus of the muscles, which allowed the limbs to be placed in unusual attitudes, and the loss of the deep reflexes. Hypotonus was not to be regarded as pathognomonic of amyotonia congenita. It was a symptom only, which occurred also in advanced rickets, spina bifida, and especially in the Mongolian type of idiocy. Some authorities regarded amyotonia congenita as an entity, affirming that it appeared acutely and reached a severe degree of paralysis in a few days, and that there was a tendency to recovery. He did not believe this, and thought that complete recovery was rare. There might be increased capacity—to perform certain actions as development took place—but a normal condition never obtained. The pathological findings were in favour of the view which regarded the condition as a myopathy. He next discussed amyotonia in relation to the progressive muscular atrophy of infants (Werdnig-Hoffmann type). The latter tended to affect the proximal rather than the distal portion of the limbs. It was slowly progressive, and often terminated fatally in six months. Typical atrophic changes were to be found in the ganglion cells of the anterior horns. Further, the intercostal muscles were frequently affected in Werdnig-Hoffmann's paralysis, but rarely in the myopathies. The hypotonus, too, was not so great in Werdnig-Hoffmann's paralysis. There was some difficulty in distinguishing the distal type of myopathy from the peroneal type of Charcot-Marie-Tooth, in that both started in the distal muscles, and were both familial and slowly progressive. In the latter, however, sensory changes were present and no deformities occurred. There were definite changes, too, in the spinal cord in the peroneal type, whilst in the distal type the cord was normal. The myopathies formed one large group and were primary diseases of muscle. Batten's remarks were illustrated by a number of beautiful lantern slides.

Gordon Holmes supported the conclusions of Spiller and Batten that there was no essential difference between amyotonia and the myopathies.

Professor Bruns (Hanover) having spoken briefly, Sachs pointed out that the most important task was to find out what was the underlying cause of these familial muscular affections. Were they due to changes in the ductless glands? Or to what were they due? He spoke hopefully of the prospects of considerable improvement in these cases. Foerster (Breslau) and Fisher, who followed, also took this view.

Discussion on Parasyphilis.

At the concluding meeting of this Section on Tuesday morning the subject for discussion was the nature of the condition named "parasyphilis." Professor Nonne (Hamburg), who spoke in German, gave a masterly summary of the subject; and in the course of developing his argument reviewed nearly all the most valuable contributions that have been made on the matter. The essential points of difference between tabes and general paralysis and so-called syphilitic disease of the nervous system were clinical and anatomical. Regarded clinically, the two former diseases, tabes and general paralysis, were slow or generally progressive, and there was uniformity of the clinical picture. As a rule, there was a long interval

between the original infection and the appearance of the disease. Then there was the failure of the usual anti-syphilitic remedies. Anatomically they differed in the systematic way in which the following conditions were found. In the case of tabes there was the commencement of the disease in certain defined parts of the nervous system. Then it progressed in a distinctive fashion, whilst there was, further, the primary neuro-degenerative character of the disease. General paralysis showed a predilection for certain parts of the brain, and a characteristic apposition of inflammatory and purely degenerative processes. There was evidence, too, of certain distinctive forms of cells. He quoted Fournier as saying that tabes and general paralysis were of syphilitic origin, but not of syphilitic nature, owing to the evidence of pathological anatomy. Strümpel, too, had said that the pre-existence of syphilis was a *sine qua non* of tabes, whilst Erb doubted whether, in view of many clinical facts, they could speak of meta-, para-, or post-syphilis, and Möbius affirmed that every case of tabes arose from syphilis. Häschl had stated that progressive paralysis was no other than a late result of syphilis—an encephalitis syphilitica of the cerebral substance ending in atrophy of the brain. The discovery of Wassermann and the performance of lumbar puncture assisted materially in cases in which there was no history of syphilis. Plaut's statistics had shown that the Wassermann test had been positive in all but one out of 183 cases. The answer to the question, Were tabes and general paralysis typical diseases in the same way as lues cerebro-spinalis? was both Yes and No. The former because certain symptoms such as papillary anomalies, absence of tendon reflexes, and constant subjective and objective disturbances of sensibility were always to be noted. "No" because both diseases could show such a confused variety of forms. Dealing next with the period between infection and the appearance of the disease, Nonne said that the long interval was not confined to tabes and general paralysis. He had seen a case in which an interval of thirty years had occurred in ordinary cerebro-spinal lues. As a rule the symptoms in the former were so slight at the beginning that the patient rarely consulted a doctor, whereas in cerebro-spinal lues the symptoms were often alarming, and the doctor saw the patient much earlier. With regard to the other clinical point mentioned—the uselessness of the usual antisyphilitic remedies—this too occurred in tertiary syphilis. In the case of old gummata in which there was little tissue capable of absorption, the spirochaete was found to be proof against known remedies. Before Noguchi's discovery Hoche explained the fact that treatment in cerebro-spinal lues was so frequently valuable by affirming that the excitant was present in the tissues, but was not present in tabes. Turning again to the anatomical side of the question, the anatomical marks of lues did not always suffice for a determination of its luetic nature. The anatomical findings in paralysis and tabes showed no distinction in their entities from the syphilitic diseases. Having discussed certain investigations connected with the *Spirochaeta pallida*, he stated that general paralysis and tabes were to be regarded as a spirillosis of the brain and spinal cord. He then analysed Noguchi's experiments at length and the conclusions to be drawn from them. Briefly, they went to prove the syphilitic nature of tabes and general paralysis. They could no longer look upon meta-lues as a "meta" disease, but had to regard it as evidence of a poison of the syphilitic excitant still active in the nervous system.

Dr. F. W. Mott, after paying a fitting tribute to the survey Professor Nonne had given, referred first to the primary and secondary symptoms of parasyphilis. In a record of 600 *post-mortem* examinations in general paralysis, he remarked the difficulty there was in finding signs of syphilis on the *post-mortem* table. Very frequently t. re was a nodular fibrosis of the aorta. The pathology of the condition presented great difficulties. Why, for instance, in tabes did they have an elective action? He was disposed to believe that the toxins passed along the perivascular lymphatics to the posterior roots of the spinal cord. In general paralysis the toxins travelled up to the parotid. They affected eventually the fore-brain, causing wasting of the frontal lobes without actual infection. But sooner or later the spirochaete began to grow. The toxin theory would explain matters, as they alone could pass along the lymphatics. His conclusion was that tabes and general paralysis was one and the same disease affecting different parts of the nervous system. The analogy of the condition to trypanosomiasis was not to be disregarded, and he appeared to suggest that the relationship was closer than was sometimes imagined. The whole character of syphilis was changing. Whether that was due to partial immunization of the race he could not say. He gave some striking and interesting statistics of the relative proportion of general paralysis in the West and East of London. The lower the social scale in women the greater the incidence of general paralysis. That was not so in the case of men. In the case of the West End the proportion of males so affected was 6 to 1, in the East End 5 to 1. Dr. Mott's valuable contribution was heartily applauded.

Léri said it was a question whether primary optic atrophy and lateral sclerosis ought not to be included in the parasyphilitic group. Tabetic blindness did not often accompany the ordinary signs of tabes. He had confined his attention in particular to cases of optic atrophy which accompanied abolition of the knee-jerks. Histologically it had been shown that primary optic atrophy was absolutely analogous with tabetic optic atrophy. Parasyphilis arose directly from syphilis and not from non-syphilitic affections developed on a syphilitic ground. Massary (Paris) followed and referred to the work of Noguchi, and Wollenberg (Strassburg), who spoke in German, mentioned the anatomical investigations of Steiner in connexion with the central nervous system of syphilitic rabbits. The changes for the most part consisted of inflammatory infiltration round the vessels of the central nervous system in the cerebral cortex and perineurium. This, for the most part, consisted of plasma cells with very few lymphocytes. The part of the brain near the spinal cord was most affected.

Dr. Henry Head (London), as the result of his own researches, had come to the conclusion that parasyphilis of the nervous system was a purely clinical conception. It was a diseased state which might affect any part of the brain or spinal cord. Some forms of progressive muscular atrophy, lateral and combined sclerosis, primary optic atrophy, and periodic epileptiform attacks might be equally manifestations of parasyphilis. Parasyphilitic states were peculiarly liable to arise after mild syphilitic infection, 60 per cent. of cases of tabes having suffered at most from a primary sore. Further, in dementia paralytica and in active unhealed cases of tabes the cerebro-spinal fluid yielded a positive Wassermann reaction. Dr. Head then referred to the question of "hyperallergie." The clinical manifestations of "parasyphilis" were an expression of the reaction and necrosis of hypersensitized areas of the nervous system evoked by the reappearance of the *Spirochaeta pallida*. The hypersensitive state of the tissues of the central nervous system was in all probability produced by the passage of the spirochaetes or their toxins along the nerves from the skin and mucous membranes during the secondary period. From the pathological point of view the term "parasyphilis" was inadmissible. These states depended on the reaction of hypersensitized tissues to the spirochaete or its toxins, and the reaction was as truly syphilitic as was the production of gummata.

Dr. McIntosh (London) then gave the conclusions arrived at by Sir William Gowers and himself from a pathological study of the question. He looked upon tabes and general paralysis as purely syphilitic diseases due to the direct action of the *Spirochaeta pallida*, and organ lesions equivalent to other organ lesions of syphilis, such as hepatitis and orchitis. He regarded general paralysis as a parenchymatous encephalitis and tabes as a myelitis. There was proliferation of the glia and interstitial tissues and degeneration of the nerve cells. The degeneration of the nerve cells was progressive, and antisyphilitic treatment had no effect when they were injured beyond a certain point. The parasyphilitic reaction differed only from the gummatous reaction in the location of the lesion. Parasyphilis was a tertiary lesion; the tissues were hyper-immune in the sense of von Pirquet, and therefore a hyperallergic reaction would occur as the result of an application of the virus. Sachs was quite willing to drop the term "parasyphilis" and call it "syphilis of the nervous system." "Tabes" and "general paralysis" were merely convenient terms. A great change had come over the general complexion of tabes and general paralysis in our time. This might be due to immunization of the race, or greater

"syphilization" of the race. Or again, it might be the result of specific treatment. He believed the specific virus had changed.

Professor Donath (Budapest) followed, and Dr. Swift (America) gave some interesting results of experiments carried out at the Rockefeller Institute. These were based upon the suggestion of Nonne that the serum of patients suffering from syphilis might have a curative effect. Lumbar puncture was done, and when the cerebro-spinal pressure had been reduced the serum was allowed to flow in by gravity. It must not be injected by means of the syringe. These experiments were at present incomplete, but the results so far had been encouraging. Lewy (Breslau) said that the spirochaete had been found in the cerebro-spinal fluid of a case of tabes. Dr. Purves Stewart (London) and Dr. Dercum also spoke, and then Professor Nonne and Dr. Mott dealt with the points raised by the various speakers.

Clinical Demonstration.

On Friday afternoon the Section met at the National Hospital, Queen Square, when patients were shown exhibiting the various forms of familial and hereditary diseases of the nervous system. Lantern slides were also shown exhibiting a number of curious features in nervous pathology, whilst a number of pathological specimens were also on view. Tea was provided for the members of the Section in the quadrangle of the hospital.

Vote of Thanks.

At the concluding meeting Dr. Fisher gave expression to the feeling of every member of the Section of Neuro-Pathology in moving a vote of thanks to the President, Sir David Ferrier, for his admirable conduct in the chair, and did not omit to include the indefatigable Secretaries, Drs. Head and Batten, to whom so much of the success of the Section was undoubtedly due. The motion was carried with acclamation.

DERMATOLOGY.

THE proceedings of the session on Thursday commenced with a display of rare and interesting cases by Drs. Sequeira, Adamson, and others.

Discussion on Epithelioma of the Skin, Benign and Malignant.

Professor Darier (Paris) read a paper on naevo-carcinoma, under which name he included malignant tumours arising from naevi and soft warts. As these tumours were of epithelial origin, they should be classified under the epithelial group of skin neoplasms—in a word as "epitheliomata." The treatment of these naevo-carcinomata included electrolysis, and surgical removal in selected cases, and should be undertaken before dissemination had occurred.

Professor J. A. Fordyce (New York) showed a series of forty admirable lantern slides, illustrating various types of malignant tumours of the skin.

Professor Yadassohn (Berne) classified the subject under the following headings, according to the etiology: A.—(1) Infectious types—for example, molluscum contagiosum and some of doubtful etiology—for example, condyloma acuminata; (2) chemical—for example, those due to tar and paraffin; (3) mechanical—for example, corns; (4) actinic—*x* ray. B.—Those of unknown etiology, such as the various types of naevi—for example, sebacei, pilosus, adenomatosus.

In the discussion which followed, Professor Dubreuilh (Bordeaux) emphasized his opinion that the initiating factor in the production of carcinomata was of parasitic nature. Professor G. Ciarrocchi (Rome) spoke of the treatment, laying stress on the uses of a new glycerine-arsenic preparation. Drs. Nicholas and Favre (Lyons) described recently discovered intracellular granules and filaments found in cutaneous neoplasms. Professor Noble (Vienna) reported success with mesothorium in doses equivalent to 22 mg. of radium bromide in selected cases of rodent ulcer. Mr. McDonagh (London) suggested a classification based on the origin of the growths from (1) the epidermis, (2) appendicular structures, and (3) mixed epidermic appendicular structures. Professor Saalfeld (Berlin) confirmed Noble's results with mesothorium, and Professor Ullmann (Vienna) discussed the etiology of arsenic cancer. Professor Unna (Hamburg) expressed his pleasure at hearing that his French colleagues supported his view of the epithelial nature of the naevus cell, and the suggestion of a stimulating action of the pigment on the further production of metaplastic changes and increase of the naevus cells.

Discussion on Alopecia Areata and Allied Conditions.

Professor Sabouraud (Paris) expressed the opinion that alopecia areata must no longer be regarded as a local but as a general disease with local manifestations. He admitted that Jacquet's theory suggesting a reflex dental etiology was only applicable to a few cases, whereas there was a frequently associated trophic disturbance of the nail growth, and a not rare concomitance of vitiligo, psoriasis, and lupus erythematosus—all diseases associated with constitutional and metabolic disturbances of unknown character. To the same category belonged those cases which occurred in association with syphilis and tuberculosis. Its incidence after traumatism, at the menopause, and after castration would seem to point to an associated neuropathic change.

Professor Pelizzari (Florence) agreed with Sabouraud in considering alopecia areata in the light of a symptomatic syndrome rather than as an entity, and instanced the conditions known by various names which closely resembled the symptoms under discussion—as, for example, those cases of baldness associated with cicatricial atrophy—in support of this view.

Dr. Bulkley (New York) said that his opinion coincided with Dr. Sabouraud's. He urged the energetic exhibition of large doses of iron carbonate, with strychnine and phosphoric acid, in all cases associated with nervous instability.

Professor Dubreuilh (Bordeaux), who read a paper by Drs. Petges and Muratet, stated that there was no evidence for a syphilitic etiology.

Professor C. Ciarrocchi (Rome), from an examination of 500 cases, was in favour of a trophoneurotic origin.

In his summary of 65 cases, Professor Noble (Vienna) came to the conclusion that familial and hereditary factors played a very considerable part in the etiology, but that a syphilitic taint was unimportant.

Sir Dyce Duckworth strongly supported the neuropathic theory in a very able paper. He had never observed that Graves's disease gave rise to the condition, nor could his colleague, Mr. Berry, whose work on the thyroid gland was well known, recollect the clinical association.

Professor A. Whitfield (London) drew attention to the local conditions which he had noticed had sometimes preceded the appearance of alopecia areata, in particular ringworm of the scalp and pediculosis capitis. Other types had undoubted relation to the mastoid operation, pityriasis capitis, and defects of vision.

Finally, Dr. Sequeira stated that he had tested Jacquet's theory of a dental etiology in 50 cases of alopecia areata at the London Hospital. The hypothesis seemed at first to be singularly applicable, but a subsequent analysis of 50 mixed cases in other departments had shown an almost equal co-existence of caries of the teeth.

Professor Yadassohn (Berne) stated that in his opinion the question of the infectivity of alopecia areata had been somewhat light-heartedly shelved. It was quite certain that in a few isolated cases the disease had been conveyed from one patient to another.

Discussion on the Vaccine Treatment of Skin Diseases.

The discussion was opened by Professor Gilchrist of the Johns Hopkins University, who admirably summarized the present unstable position of this department of therapeutics. He compared it to that occupied by radiotherapy at the end of the first two years of its application. The wholesale injection in unsuitable cases of commercial stock vaccines, especially in America, was threatening to bring the method into disrepute with the public, and there were those among them who, on the advice of friends whose experiences had been unfortunate, utterly refused inoculation where its services would be invaluable in skilful hands. Professor Gilchrist emphasized the importance of trying at once an autogenous vaccine in all cases that had failed to respond to the first dose of the stock preparation, and he was strongly in favour of employing none

but skilled bacteriologists for this very special branch. The diseases which in his hands had proved most amenable to vaccines were: (1) Chronic and subacute cases of staphylococcic infection, as, for example, weeping eczemas with a staphylococcic etiology; (2) pustular types of acne rosacea; (3) acne vulgaris, in which the acne bacillus often existed in pure culture, and a mixed vaccine of staphylococcus and acne bacillus had the best effect (10 to 20 million of acne bacillus repeated three or four times at intervals of ten to twelve days); (4) furunculosis, in which staphylococcus vaccines were used; (5) blastomycosis, in which an improvement equal to 80 per cent. had manifested itself after one injection of a pure filtrate of the three-months-old culture.

Dr. A. Whitfield (London) gave a very valuable account of his experiences with the method, which he had found of very great service in (1) furunculosis of the scattered type, not dependent on some source of local irritation—as, for example, in furunculosis of the neck in association with the friction of a high collar; (2) acne vulgaris, in which it was his practice to give large doses of from 125 to 250 million of the mixed staphylococcus and acne bacillus vaccines; (3) in acute and subacute erysipelatoid affections, in which the streptococcus vaccines had yielded excellent results in his hands; and (4) early sycosis. He discussed at considerable length the advisability of estimating the opsonic index as a preliminary measure, but gave good reasons for his opinion that the clinical and bacteriological estimations were often directly opposed, and that such estimations might therefore be actually misleading in practice. The estimation was of value in those cases of mixed bacterial infections in which it was doubtful which organism was responsible, and which only secondary implantations. In such the discovery of a low opsonic index for a certain organism would suggest the vaccine to employ. Regarding the length of time during which injections should be persisted with, Dr. Whitfield advised for furunculosis a course of three months, and if cured in that time, a cessation. In some cases the patient would have four or five outbreaks in the year; theoretically such patients should be treated continuously for eighteen months, and in general it could be stated that a man should be kept free of his lesions for double the expected time of recurrence. The vaccine treatment of staphylococcic sycosis was only successful in very early cases, when the infection had been occasionally found to clear up with only one or two injections. Even in chronic cases the initial dose was usually successful to a point, but the succeeding injections ultimately failed to clear up the condition and recourse to ointments and *x*-ray epilation was usually the end procedure. Dr. Whitfield was emphatic in his opinion as to the advantages of streptococcic vaccines in erysipelas, and subacute erysipelatoid infections. These had invariably responded to vaccine treatment, either stock, or where this failed after the first injection, autogenous. Tuberculin had been useful in small doses in the tuberculide affections, for example, erythema indurata (Bazin), in clearing up ulceration, but not in preventing the development of fresh nodules. In lupus vulgaris he could not recommend it. Dr. Lassueur (Lausanne), and Dr. Rockwell Varney (Michigan) also spoke. The latter laid stress on the importance in staphylococcic infections of employing vaccine from similar clinical cases.

Dr. MacLeod (London) said he agreed with Professor Whitfield's summary of the present position. He was not convinced that the acne bacillus was the cause of the comedo. He had seen no good effects from tuberculin. He was followed by Professor Yanowsky (Prague) who claimed some success for tuberculin on lupus. He had had excellent results with injections of antidiphtheritic serum in cases of erysipelas. Local treatment must never be neglected in favour of vaccines.

Independent Papers.

In the afternoon Professor V. Petersen (St. Petersburg) read an interesting summary of his successful results with salvarsan in the treatment of 3 cases of blastomycosis.

Professor Peyri y Rocamora (Barcelona) read a paper on psoriasis, which, in his opinion, was an individual reaction to various internal and external factors.

Dr. Allan Jamieson (Edinburgh) advanced an interesting hypothesis as to the nature of psoriasis to the effect that it was due to the absorption of ill-digested metabolic products. He had had very good results from the administration of lactic-acid-producing tablets in several cases.

Other papers on the schedule for the day were by Dr. Saalfeld (Berlin), on the histology of certain multiple skin tumours; Dr. Heidingsfeld (Cincinnati), on congenital absence of the nails; Drs. Favre, Nicholas and Durand (Lyons), on lymphogranulomatosis inguinale subacutis; and by Dr. Goodwin Tomkinson (Glasgow), on the treatment of lupus vulgaris.

Radio-therapy.

After viewing a most excellent series of 36 rare cases the Section resumed its work in two separate parties, as no less than nine papers were scheduled to be read and discussed.

Under Sir Malcolm Morris's presidency, a paper by Drs. Bellot, Degrais, and Wickham (Paris) on the action of radium on certain hypertrophic modifications of the epidermis dealt with the advantages of this method over any other in the treatment of the various kinds of warts, and especially in the removal of painful corns.

Mr. Hayward Pinch, of the Radium Institute, followed with a copiously illustrated discourse on the type of case most amenable to the rays, including in that category naevi of all kinds, warts, the lichenification (*névrodermite*) of Vidal, psoriasis, rodent ulcer, lupus erythematosus, keloid, Paget's disease of the nipple, and moles. For lupus vulgaris he preferred to order Finsen light where possible. He described the method and applicators in use.

Tuberculin.

Professor Oppenheim (Vienna) read a detailed account of his study of the effect of age, sex, and a number of different diseases on the reaction of the skin to tuberculin. Most local skin diseases had no effect. Lupus vulgaris increased the reaction, whilst secondary syphilis, gummata, and erythema toxicum diminished the reaction.

Dr. Klausner (Prague) discussed the histology of granuloma annulare with the help of some excellent microscopic slides, and Dr. Ritter (Hamburg) read a paper on the action of *x* rays on malignant metastases.

Short Papers.

Under the vice-presidency of Dr. Allan Jamieson (Edinburgh) the following papers were also read in another theatre: (1) Indications from the urine in treatment of skin diseases, by Dr. Bulkley (New York); (2) Subcutaneous calcinosis, by Dr. F. Parkes Weber (London); (3) Mycosis d'emblée, by Dr. G. Pernet (London); (4) Varieties of chronic congenital pemphigus, by Drs. Nicholas and Montot (Lyon).

Museum.

Dr. Sequeira (London Hospital) had taken endless pains to make the department of the museum concerned with dermatology representative and complete. It contained several drawings of historical interest, including the original drawings by Sir Jonathan Hutchinson of the notched teeth for ever associated with his name; the first case of rodent ulcer ever cured by *x* rays from Dr. Sequeira's collection; the first case of acanthosis nigricans recognized in this country by Sir Malcolm Morris; the original drawings made by Dr. J. J. Pringle of the disease that bears his name; and a host of valuable drawings and *moulage* reproductions kindly lent by Professors Neisser (Breslau), Noble (Vienna), Zinsser (Cologne), Dr. Gilchrist (America), Dr. Lawrence (Melbourne), and Drs. Galloway, Graham Little, and McDonagh (London). The museum was certainly one of the most notable collections ever exhibited to dermatologists, and reflects the greatest credit on the organizer.

UROLOGY.

The President of the Section (Mr. Hurry Fenwick) having opened its first meeting with a few well chosen words of welcome, reviewed some of the recent advances in urology, dealing chiefly with the introduction of the cystoscope by Nitze, and the discovery of the *x* rays by Roentgen. He showed how from these two signal advances the recent improvements in diagnosis and technique were derived; and that on account of the more accurate and scientific

methods now in vogue, the surgeon could approach the patient with a fuller and more exact knowledge of the pathological conditions he had to deal with. He enumerated instances of this kind, and then went on to show that not only had urology received much from other branches of medical science, but it had done something in return. For example, skiagraphy had learnt much about the interpretation of doubtful shadows in the abdomen and pelvis from the introduction and use of the opaque ureteric bougie, and medicine had extended her ideas as to the various forms of Bright's disease through the labours of the urologists.

MALIGNANT DISEASE OF THE PROSTATE.

Professor H. Kümmel (Hamburg) opened the discussion on the diagnosis and treatment of early malignant disease of the prostate in a lucid and comprehensive paper which covered an extremely large field. He first gave statistics as to the frequency of cancer of the prostate as compared with cancer in general, and also as to the relative frequency of benign and malignant tumours of the organ. Turning to the discussion of symptoms, he showed that malignant disease might appear in hypertrophied or in non-hypertrophied prostates, and that in these two classes the symptomatology was different. In the former class the symptoms were chiefly those of ordinary senile enlargement, in the latter they were due to the carcinoma alone. He mentioned that occasionally cancer of the prostate might give rise to no symptoms till after metastases had occurred, and the condition become inoperable; but that in the majority of cases the early symptoms were frequency and difficulty of micturition. Having discussed the various forms the cancerous prostate might take, he took up the question of treatment. In the early stages, he said, the treatment was undoubtedly surgical, and that a radical removal of the gland by Young's method, or one of the allied operations, was the method of choice. He gave statistics from the leading urologists as to the results of this operation, and showed that well-authenticated cases of cure, in one case of 9 years' duration, had been obtained.

Professor H. Young (Baltimore) was the second reporter. Having reviewed the symptoms of the early cases that had been under his care, he pointed out that the malignant process tended to spread upwards into the alveolar tissue between the seminal vesicles, and from thence a glandular infection resulted. These observations led him to devise his operation, which consisted in the removal of the prostate within its sheath of fascia, the seminal vesicles, the lower end of the vasa, and a portion of the base of the bladder all in one mass. He had done this operation six times; of these one case died three years and another six and a half years after the operation. In the former a recurrence was found at the autopsy, in the latter none. Dr. Young then described the good results he obtained by doing an ordinary perineal prostatectomy in cases that were too advanced for the radical operation. These patients remained free from urinary trouble for a considerable time, occasionally till death, which of course was due to the spread of the cancer.

In the discussion that followed, Professor Gayet (Lyons) described his operation for the removal of cancerous prostate. His incision commenced at the tip of the coccyx, encircled the anus, and ended in the anterior part of the perineum. This, he claimed, gave more room than that used by Young, but his cases appeared to have suffered from stricture after the operation.

Mr. Joly (London) described 3 cases he had operated on by Young's method. All of them had recovered control after the operation. One was alive and well two and a quarter years; the others died in less than a year after operation. He described a fourth case which he had operated on by a combined abdomino-perineal method, but the patient died of shock.

Dr. H. Schüller (Vienna) dwelt on the difficulty of diagnosis in these cases.

Dr. O. Pasteau (Paris) recounted the results he had obtained by means of radium in cases of cancer of the prostate. He enclosed the tube of radium in an ordinary catheter and passed it till the radium lay in the prostatic urethra. By this means he had two patients apparently cured; a third was relieved of his urinary symptoms, but died of metastases.

Professor Rovsing (Copenhagen) said that he used a modification of Young's operation in 5 cases. He first made a permanent suprapubic fistula, and then removed the prostate, seminal vesicles, etc., from the perineum, completely closing the floor of the bladder.

Dr. F. Weiss (Budapest) confined himself to the question of diagnosis.

Dr. H. Wildbolz (Berne) described his modification of Young's operation designed to secure urinary control in the patients. This method was not so radical as the original one. Dr. Wildbolz operated on 8 cases; 2 of these were temporarily incontinent, the rest were continent.

Both Professor Kümmel and Professor Young replied briefly to the discussion.

EARLY RENAL AND VESICAL TUBERCULOSIS.

On Friday, August 8th, a discussion on the diagnosis and treatment of early renal and vesical tuberculosis was held jointly with the Surgical Section, and has been reported under that Section.

HAEMIC AFFECTIONS OF THE URINARY TRACT.

On Saturday, August 9th, the subject for discussion was the diagnosis and treatment of haemic infections of the urinary tract. Professor G. E. Brewer (New York), who was the first reporter, pointed out how for long infections of the upper urinary tract were thought to be ascending, and the only type of haemic infection recognized was where the kidneys were involved in a general pyaemia or septicaemia. Later on Israel had shown that haematogenous infection of the kidneys could be caused through quite insignificant lesions, such as furuncles. The third step was when it was found that very often these lesions were unilateral, at least in their early stages. Professor Brewer then briefly called attention to some of his own experiments in which one kidney was slightly injured and living bacteria introduced into the blood stream. The resulting kidney lesion was sometimes unilateral, and always much more severe on the injured side. Clinically he recognized three types of acute haematogenous nephritis —the fulminating, the intermediate, and the mild. The fulminating was ushered in by a rigor as a rule. The temperature rapidly rose to 104° or 105°; the pulse to 120 or more. Signs of intense toxaemia were present, and were progressive. Tenderness and muscular rigidity were present in one flank, and also a slight amount of vague pain. The urine appeared normal—at most a trace of albumin and a few blood and pus cells were found. This was due to the fact that the infected kidney excreted little or nothing. The symptoms grew rapidly worse, and death invariably ensued unless a nephrectomy was performed. Professor Brewer had 16 cases; 6 of these were treated either expectantly or by nephrotomy and drainage, and all died; while 10 treated by early nephrectomy all recovered. The intermediate type was the most common; the symptoms were practically those of the fulminating type, but in a less degree. The temperature was 102° to 103°, and the toxic symptoms not so marked. Again the urine was almost normal. Professor Brewer considered decapsulation the best treatment for these cases. The lesions were almost all subcapsular, and therefore removal of the capsule drained them better than nephrotomy. The mild type were generally diagnosed as idiopathic pyelitis. The symptoms were slight fever and tenderness in the costo-vertebral angle. Pain might not be a marked symptom. The treatment consisted of rest in bed, urotropin, and large quantities of water by the mouth.

Professor Rovsing (Copenhagen), who was the second reporter, divided haematogenous nephritis into two classes —the first in which the infective agent belonged to the colon bacillus group, and the second in which the pyogenic micrococci were present; the former was the class most frequently met with. In acute haematogenous nephritis the symptoms were usually sudden onset with rigors, high temperature, pain in loins or in one kidney region. Frequently haematuria was present at the onset, later the urine was turbid and contained pus, blood cells and bacteria. Tube casts were present if the infection was micrococcal, but were absent in the colon bacilli class. The cases were frequently diagnosed as renal colic, appendicitis, or some other acute abdominal trouble. The author stated he found his sign of great value in the

differential diagnosis, pressure on the descending colon increasing the pain of appendicitis, but having no effect on that of nephritis. Occasionally the attacks were recurrent, or developed into general septicaemia. The finding of normal urine coming from one kidney and infected from the other usually clinched the diagnosis. Discussing the treatment, Professor Rovsing said that he had to remove the kidney in a few cases of micrococcal nephritis. Once he did a partial resection where the disease was confined to the upper pole. In the colon bacillus group he never found operation necessary unless the case was complicated by stone, dilatation of the pelvis from narrowing or kinking of the ureter, or in cases of movable kidney. Even then the operation was directed towards the complication. He found salol, combined with rest in bed and large quantities (4 to 6 litres per diem) of distilled water, useful. In the more chronic cases he used autogenous vaccines with considerable success.

Mr. Frank Kidd (London) described the method he used in examining and treating these cases. He stated that in the male, pyuria with fever meant inflammation in the deep urethra or in the kidney; in the female these symptoms always pointed to kidney trouble. He thought that the kidney often got well before the bladder. He laid stress on the good results obtained by lavage of the renal pelvis, and instillations where the bladder was also infected. He thought that the disease rarely proved fatal, except when the patient was in a very depressed condition, and that nephrectomy was rarely if ever indicated. Generally rest, diuretics, and urotropin, and if the condition was chronic lavage of the renal pelvis, was the best line of treatment.

Dr. J. Cunningham (Boston) divided acute unilateral haematogenous infection of the kidney into a suppurative and a non-suppurative form. He thought an early nephrectomy was indicated in the first class, but in the second he preferred to try palliative methods first, and only do a nephrectomy if the symptoms did not clear up quickly.

Dr. Berg (Frankfort) described an interesting case of a patient with right-sided pyelitis complicated by appendicitis.

Dr. Picker (Budapest) thought that the fact that some cases persisted in spite of treatment might be due to the configuration of the renal pelvis being unsuitable for drainage.

Professor Brewer, in his reply, stated that he thought the micrococcal cases more serious than the colon bacillus ones, and more frequently required nephrectomy. He thought there was no such thing as haemic pyelitis; he had tried to produce it experimentally, but had always failed. What he did produce was a pyelo-nephritis.

Professor Rovsing quoted a case in which he had seen multiple abscesses in the kidney due to colon bacilli disappear. He uttered a warning against the indiscriminate use of collargol for pyelography, or for lavage of the renal pelvis. Six or seven deaths had been reported from its use, and other serious accidents had happened.

Independent Papers.

On the last day Dr. Georges Luys (Paris) read a paper on catheterization of the ejaculatory ducts. This procedure was indicated in retention of vesicular fluid, in cases of painful ejaculations, and in chronic seminal vesiculitis. In the latter case it facilitated the emptying of the vesicles by massage. The operation could easily be performed through the author's urethroscope.

Dr. Hugo Schüller (Vienna) demonstrated a series of instruments devised by him for the topical application of radium to various parts of the lower urinary tract. Where the treatment was directed towards the urethra or prostate, special bougies with a small receptacle at the end for the tube of radium were constructed. In cases of bladder tumours the author devised a cystoscope resembling the ordinary operating cystoscope, by which the tube of radium could be applied directly to the neoplasm. Dr. Schüller thought he had obtained the best results in prostatic cases, both in benign and malignant enlargement; in bladder tumours the benign papilloma markedly diminished in size under this treatment.

Dr. R. Picker (Budapest) applied his anatomical findings (described the previous day) to the treatment of spermatocystitis. He strongly recommended massage as the most rational method of treating this condition.

Mr. Joly (London) read a paper on congenital diverticula of the bladder. Speaking of the large single diverticula he recommended excision as the most satisfactory method of treatment. He then described 2 cases that had been under his care and on whom excision had been performed. In the second part of his paper he made the suggestion that some of these diverticula might be due to the persistence of supernumerary ureteric buds. That in these cases two ureteric buds sprang from the Wolffian duct; one of these became the normal ureter, while the other failed to reach the kidney, and became dilated into a diverticulum.

In the absence of Professor Rochet, Dr. Léon Thevenot read a paper entitled: Can the so-called senile enlargement of the prostate appear in cases of stricture of the urethra? The author appeared to hold the view that this combination was impossible, as in stricture cases the prostate was destroyed from back pressure, chronic prostatitis, suppuration, etc.; or its structure was so altered that the development of adenomata was impossible.

Dr. Georges Nicolich (Trieste) showed the specimens of 2 cases in which he had done a subtotal cystectomy for tumour. He removed the whole bladder with the exception of the trigone and the orifices. Both cases recovered, and from the small fragment left behind a capacious and functionating bladder had developed. He also showed the bladder of a case where fatal air embolism had followed injection of air into the bladder. There was a small abrasion in the mucous membrane over the posterior wall through which the air probably entered.

Dr. Berg (Frankfort) exhibited a large cystine calculus he had removed from a child.

At the termination of the sitting Professor Rovsing proposed, on behalf of the visitors, that the fourteenth Section should send a cordial vote of thanks to the General Secretary and the Central Committee for their labours in organizing such a successful Congress. This was passed with acclamation, and the President of the Section undertook to see that it was forwarded to the proper quarter.

Demonstrations.

The meeting on Monday, August 11th, was given up to a series of epidiascope demonstrations.

Dr. Newman (Glasgow) showed a series of coloured drawings illustrating early renal and vesical tuberculosis. They were all drawn directly from the cystoscope, and showed very clearly the changes that the ureteric orifice undergoes in renal tuberculosis, while a second series illustrated early vesicle tuberculosis. Dr. Newman's conclusions were that: (1) If the ureteric orifice was normal there was no serious disease of the corresponding kidney; (2) tuberculosis of the ureteric orifice was always associated with tuberculosis of the corresponding kidney; (3) that in tubercle of the bladder the ureters were not involved unless the kidney was infected.

Dr. R. Picker (Budapest) showed an interesting series of photographs illustrating his investigations on the anatomy of the seminal vesicles. He injected the vesicles with bismuth paste through the vas, and then dissected them. He recognized five anatomical types, according to whether the main tubes were straight or spirally twisted, and whether they had branches or diverticula or not. To examine the ampullae of the vasa he had radiograms taken of his specimens.

Dr. Kutner (Berlin) read a short paper on the treatment of bladder tumours by combined applications of the high-frequency coagulation and the electric snare. He stated that with the high-frequency method (fulguration) before the slough had entirely separated he had had severe bleeding, which delayed the convalescence. He also pointed out that these cases were very liable to infection. He therefore treated the tumour first by fulguration, and about five days later removed the necrotic mass by means of an electric snare. By this means, he maintained, he avoided the accidents of haemorrhage and sepsis. His paper was illustrated by photographs.

Mr. Thomson Walker (London) showed an interesting series of slides illustrating pyelography. Having described the method he used to prevent the over-filling of the renal pelvis, he demonstrated three series of cases. The first was where hydronephrosis was suspected, but the renal pelvis was proved to be normal. In the second some obscure abdominal tumours, simulating kidney conditions,

were demonstrated to be unconnected with the kidney, while the third series consisted of cases of hydronephrosis due to stone, movable kidney, aberrant renal arteries, etc. In each case the diagnosis made by this method was confirmed by operation.

Dr. Posner (Berlin) showed a series of photomicrographs of urinary sediments taken by means of the dark-ground illumination (ultra-microscope). By this means he was easily able to photograph almost transparent objects, such as pus and epithelial cells, crystals, tube casts, etc. The series ought to prove very useful for teaching purposes.

Professor Wahby (Cairo) demonstrated a series of specimens illustrating the anatomy of the renal vessels. They were obtained by injecting the vessels with fusible metal and then corroding the kidney.

Dr. Pasteau (Paris) exhibited photomicrographs of the effect of radium on tumours of the prostate, and also some photographs of the cystoscopic appearances of vesical diverticula.

Dr. Mosenthal (Berlin) showed a series of radiograms illustrating the differential diagnosis of obscure abdominal and pelvic shadows, and also some interesting slides of the descent of calculi down the ureter.

RHINOLOGY AND LARYNGOLOGY.

THIS Section commenced its proceedings on Thursday, under the presidency of Sir StClair Thomson, who gave a brief sketch of the progress of this department of medicine. He pointed out the marked advance that had taken place since the last Congress held in London thirty years previously; and how, thanks to improved instruments and the aid of cocaine, adrenalin and electricity, the various cavities, as the bronchi, oesophagus, stomach, and accessory sinuses, were now open to inspection and treatment. He considered that laryngology had made greater strides during the last ten years than any other speciality, and that the public hardly yet realized the benefits it conferred upon them. He concluded by giving a hearty welcome to those present, adding in French, Italian, and German a similar welcome to the distinguished foreigners who honoured the Section by their presence.

DISCUSSION ON ENDOSCOPIC METHODS.

A very excellent reception was accorded to Professors Chevalier Jackson (Pittsburg, U.S.A.) and Kilian (Berlin), who may be considered "the father of bronchoscopy." Each read a paper on the recent progress of endoscopic methods as applied to the larynx, trachea, bronchi, oesophagus, and stomach. The former dealt mainly with the progress made in the United States, while the latter confined himself to European methods. Emphasis was laid on the importance of all laryngologists acquiring a knowledge of the method for diagnostic purposes; but Professor Jackson thought that one or two specialists in each district should devote themselves more particularly to the subject, so that they might gain facility in operative procedures by constant practice, which alone could make one expert in surgical treatment. In the discussion which followed, on the other hand, Drs. Waggett (London) and Skillern (Philadelphia) put forward a plea that all laryngologists should be able to operate as well as to diagnose by this means. Statistics and accounts of cases treated were given, the mortality-rate showing a diminishing tendency as greater practice was acquired.

Improved methods of technique were dealt with at some length, and subsequently Professor Kilian gave an excellent demonstration of his recent method of suspension laryngoscopy, Dr. W. Hill (London) demonstrated his method of oesophagoscopy, and Dr. Lewissohn showed an instrument he had devised for obtaining an extensive view of the interior of the stomach, but which was useful for diagnostic purposes only, and not for operations. Dr. London (New York) also demonstrated his modified gastroscope, for which he claimed greater ease of introduction, it being curved, but, as it depended for its use upon a mirror, it could obviously be used only for diagnosis. It was generally considered that laryngologists owed much to radiography, which in the case of foreign bodies and in the examination of the oesophagus and stomach especially rendered valuable assistance.

The importance of the careful preparation of the patient and the necessity for asepsis was urged; the posture of the subject undergoing operation was also deemed of the greatest moment. For the removal of foreign bodies in the air passages the Trendelenburg position was thought the best, the action of gravity favouring their removal and preventing them from dropping further down. For diagnosis the anterior position of the cervical spine, with relaxation of the anterior muscles of the neck, was considered much the best, and this was demonstrated by Professor Moure (Bordeaux) and Mr. Hill, who stated that the credit of it really belonged to Mosher (Boston), although it was generally termed Johnson's position.

Tracheotomy was thought to be seldom necessary, while Jackson considered that oesophagotomy was never required. Considerable difference of opinion arose on the question of anaesthesia. Professor Jackson stated that it was unnecessary in the case of children, and that in the last 107 cases in children under 6 years of age he had used neither local nor general anaesthesia, his assistants knowing exactly what they each had to do. Some surgeons thought that a general anaesthetic was required, especially in the case of children, but the fact remained that Jackson could and did manage perfectly well without.

The indications for bronchoscopy were fully discussed, and the dangers considered. Dr. Mosher (Berlin) showed an adjustable speculum, and pointed out that no oesophagoscope could be considered non-dangerous, and that there was danger in the introduction of a rubber tube if done by unskilled hands. Everything should be done with the utmost care and gentleness, and foreign bodies should be extracted slowly, haste and force never being justifiable.

DISCUSSION ON INDICATIONS FOR AND RELATIVE VALUES OF TONSILLOTOMY AND TONSILLECTOMY.

Dr. Burger (Amsterdam), in introducing the discussion, advocated conservative methods, and only did tonsillotomy in children, but in adults more cases for the complete operation presented themselves in patients who had had frequent attacks of inflammation, and in cases of tubercle and malignant disease.

Dr. Goodall (Boston, U.S.A.), on the contrary, favoured more frequent tonsillectomy. He discussed the tonsil in its relation to Waldeyer's ring, and considered that they were all probably functionally similar, and that no specific function had yet been proved and no damage had yet been shown to occur through enucleation of the tonsillar portion of the ring. He discussed the question next from its surgical aspects of trauma, septic complications, haemorrhage, and alteration of the parts subsequent to operation. With reference to trauma, tonsillotomy meant less than tonsillectomy, and that resulting from the latter depended greatly upon the method adopted and the operator's dexterity. He described his method of operation and preferred ether to local anaesthesia, and out of several thousand cases had had only one of bronchopneumonia following operation. Sepsis, he thought, was more common in tonsillectomy, and so also was haemorrhage, and properly performed tonsillectomy should produce no more deformity than tonsillotomy. He then dealt with the causes for which an operation on the tonsils was required, as enlarged tonsils, their chronic inflammation, different forms of lacunar tonsillitis, and the various forms of chronic infection, as tubercle. In children he left the tonsil alone when not diseased or causing trouble, otherwise he enucleated, and in adults he performed enucleation. He dealt in detail with those cases of enlargement in singers, and thought that when the voice was already developed tonsillotomy was preferable, but when it was not so he would prefer tonsillectomy.

There was considerable divergence of opinion amongst the subsequent speakers, who seemed to range themselves into two camps, which peculiarly enough might be termed the English-speaking camp and the Continental, the former generally advocating tonsillectomy and the latter tonsillotomy.

Amongst the former were Dr. Jacques (Nancy), who employed the cold snare; Dr. E. D. Davis (London), who gave an analysis of 1,520 cases, and favoured the blunt guillotine or snare; Messrs. O'Malley, G. H. L. Whale, and T. J. Faulder of London, and Mr. Pybus and Mr. Whillis of Newcastle, who were thorough advocates for complete removal, and considered

that if the tonsil required surgical interference at all it should be treated upon surgical principles and removed.

Mr. Tilley (London) reserved tonsillotomy for a few cases of simple hypertrophy in children or very old people, and he got no more haemorrhage than formerly.

Dr. Sym (Glasgow) enucleated, but did not think it could be done by the guillotine. This statement was, however, entirely rejected by the users of that instrument. Dr. Marschik (Vienna) was inclined to favour tonsillectomy. Dr. Stookey (Salt Lake City, U.S.A.) strongly favoured tonsillectomy. Amongst those favouring tonsillotomy in general were Dr. Zétrop (Antwerp), Luc (Paris), who favoured local anaesthesia, Dr. Broeckhaert (Ghent), Dr. Kelson (London), Watson-Williams (Bristol), who thought that the tonsils exerted a protective influence, and probably prevented rheumatic infection, and therefore only diseased tonsils should be touched.

Professor Sobernheim (Berlin) reserved tonsillectomy for cancer, primary syphilis, and tubercle, and disease generally, but otherwise he preferred tonsillotomy. Dr. Friedrich (Kiel) thought that the tonsils were removed too freely nowadays, in the hope of curing general infections. Dr. Halle (Berlin) and Professor Uchermann (Christiania) were of a similar opinion. With regard to haemorrhage it was not generally considered to be greater after tonsillectomy than after tonsillotomy, and the same applied to deformity. Ethyl chloride seemed to be the anaesthetic most favoured.

Professor Burger in his reply considered that the treatment should be on general principles, and stated that he did not give a general anaesthetic at all. Dr. Goodall considered that the presence of desquamative epithelium around the follicles, cut off from the interior of the tonsil, was an indication of disease.

INDEPENDENT PAPERS.

The Treatment of Inflammation of the Sinuses.

Professor Moure (Bordeaux) discussed the after-history of sinuses that have been operated on. After a rapid survey of the various methods of operation from the point of view of the primary object of operation, that is, the removal of all infected spaces, he expressed the belief that the cavities left after operation became obliterated. Experiments upon cats and dogs were cited to illustrate the truth of his views, and he maintained that treatment by the natural openings left a cavity always open to reinfection. These views were generally held, and Sir R. Woods (Dublin) instanced 100 cases of frontal sinusitis treated by this method without sepsis. Dr. Marschick (Vienna) also agreed, and considered that the more radical the operation the better the result. Dr. Luc (Paris) advocated most radical measures with thorough curetting of the mucous lining, and he was followed upon similar lines by Dr. Guisez (Paris) and Professor Kubo (Japan). Dr. Halle (Berlin) said that he practised that method, conservative or otherwise, which he thought most suited to the case; this view was supported by Dr. Tilley (London), who considered that the fibrous tissue which entirely filled the cavity, being only of the granulation variety, would be prone to suppuration later on. Dr. Jacques (Nancy) advocated the removal only of the diseased portion of the mucous lining, and drew attention to the importance of preventing the orbital fat from filling up the cavity and obstructing drainage. Dr. Waggett (London) and Dr. Donelan agreed in the main with these views.

Radium Therapy.

Dr. Guisez (Paris) read a paper on the progress of the therapeutics of tracheal, bronchial, and oesophageal affections, and specially the treatment of oesophageal cancer with radium. He described the beneficial effect of radium upon the cancer, and dealt with certain congenital cases of dilatation and pouching of the oesophagus which disappeared under treatment. He also referred to the diagnosis of varicose conditions of the oesophagus which were cured by this means. The treatment of cancer, however, was not palliative, but the use of radium and subsequent curetting prolonged life and ameliorated the condition of the patient.

Dr. T. Harris (New York) dealt with the use of radium in the treatment of papilloma of the larynx, and suggested that treatment which did not interfere with the voice was worthy of every consideration; he instanced various cases which had done well under radium after previous abortive operations. He advocated the use of a large amount of radium, which necessitated less frequent applications and a shorter duration of exposure.

Dr. Trendenthal suggested the use of pure radium.

Foreign Bodies.

Dr. Bostella (Madrid) contributed a paper on 54 cases of foreign bodies in the oesophagus, trachea, and bronchi. He dealt with their form, shape, and character. He spoke of their usual sites and the various symptoms to which they gave rise, such as pain, tumefaction, fetidity of breath, etc. He laid special stress upon a peculiar hoarse barking cough, which he considered pathognomonic of foreign bodies in the air passages. He discussed the technique of instrumentation and illumination and the position of the patient. He used no anaesthetic at all for oesophagoscopy in children, but occasionally adults required a little cocaine. In trachea bronchoscopy he used cocaine in adults and chloroform in children, but objected to a combination of the two in children.

Professor Kubo referred to 100 cases of foreign bodies in the oesophagus that he had removed.

Complications of Inflammation of the Frontal Sinus.

Dr. H. Zwillinger (Budapest) read a paper on experimental researches regarding the mechanism of the intracranial and cerebral complications of frontal sinusitis, in which he traced the relation of the perimeningeal lymphatics to those of the upper part of the nose, and the probability of the same connexion between the former and the mucous lining of the frontal sinuses. This would explain many of the intracranial complications in diseases of the sinus. He considered that this connexion was demonstrated upon anatomical grounds.

Dr. R. H. Skillern (Philadelphia) read a paper on unsound conditions following the external radical operation on the frontal sinus. He reviewed 30 cases upon which he had operated, and mentioned cases of diplopia, paralysis of the upper lid, neuralgia deformity. He referred to a special protector which diminished the subsequent oedema of the eyelids. The paralysis disappeared generally and the hemicrania always got better.

Post-cricoid Carcinoma.

Mr. Trotter contributed a paper on the general aspects of this disease, and suggested the term "hypopharyngeal" as a better name. Stress was laid upon an early diagnosis, which was more easy than usually considered. He discussed surgical treatment from the point of view of cure, the dangers attending the operation, and the resulting mutilation and disability, as of speech, swallowing, etc.

Mr. Waggett emphasized the importance of early diagnosis long before dysphagia showed itself. He thought sufficient care was not taken to discriminate between genuinely post-cricoidal growths and those which subsequently extend there. The majority of the patients were young and middle-aged women. Pain was not a marked feature until the oesophagus was invaded. He considered that all the growths were squamous epithelioma, and that they were at first superficial, only subsequently extending to the submucous tissues, and therefore in the early stage removable, with fair prospects of immunity from local recurrence. He advised that the septic cavity should be kept widely open, and the packing frequently changed. The great factors were asepsis and good technique, and even if the larynx required removal the operation should be performed. He could not deny that up to the present the records were bad, but that was generally true of cancer anywhere; recurrences generally took place in the glands, therefore these must be removed, as was the case in cancer of the tongue. The diagnosis was not so simple as in cases of early cancer of the larynx, where the parts were in full view, but the symptoms of localized pricking sensations on swallowing pungent food and drink should lead to careful examination, as physical signs in the early stages were not marked. The means of direct examination now available should be resorted to in all doubtful cases.

Mr. P. De Santi (London) said that he had had no good results from operative interference, but thought it was because his cases were too far advanced. He advised a primary gastrostomy for feeding purposes. Mr. Logan Turner (Edinburgh) referred to 70 cases (38 per cent. in

males and 61 per cent. in females). He remarked upon the relative frequency of cancer of the upper part of the larynx in man as compared with woman. He operated by a cervical incision.

Dr. Marschik (Vienna) referred to the finding of much more extensive disease upon operation than was thought beforehand. The possibility of carcinoma occurring together with syphilis should also be recognized.

Dr. W. Hill spoke of the additional benefit radium gave. Sir R. Woods emphasized the importance of early diagnosis. Professor Uchermann (Christiania) agreed with Dr. Hill as to radium, and uttered a warning as to the danger of too much iodoform gauze, which might cause iodoform poisoning.

Pachydermia Laryngis.

Dr. Jobson Horne then read a paper on this subject, illustrated by lantern views showing the sites of growth and the appearances presented by the corresponding cord. He discussed the pathological as well as the naked eye appearances.

The Pituitary Body.

Professor Hirsch (Vienna) read a paper on the surgical treatment of affections of the pituitary body by the nasal route. He grouped pituitary growths into three classes: (1) Intracellular solid tumours, which enlarge towards the sphenoidal sinus, but do not grow upwards; (2) intracranial solid tumours, which enlarge upwards towards the brain; (3) cystic tumours consisting of one large cyst, or smaller ones. It was not possible to decide save by operation whether the growth was cystic or solid, but x rays would show whether or not it was intracranial or not, mainly by the shape and size of the pituitary fossa. The tumour might press the optic chiasma against the vessels and cause blindness. He illustrated his remarks by diagrams. The intracranial tumours were inoperable by the nasal route, or by the cranial route, as they could not be detached from the floor of the fossa. Only the intracellular could be operated upon, and that could be done by bold methods. He gave figures showing the relative mortality of his operation, Krause's method, Victor Horsley's method, Schloffer's and Cushing's methods, showing that only the latter had a mortality as low as his own. He also illustrated his remarks by lantern slides.

He was followed by Professor Cushing, who discussed the subject very fully, and also illustrated his remarks by lantern slides. He included in his statistics some cases since those referred to by Professor Hirsch, thus further reducing his mortality. He asked what were the general symptoms of the disease of the pituitary body, and stated that it was as common as thyroid disease, but as yet had gone unobserved. He treated the symptoms in various groups, as those of the skin, bones, joints, general appearance, absence of hair, changes in the subcutaneous tissues, which looked somewhat like renal disease. He showed how intracranial interference would often greatly benefit a growth that could not be removed by any method. Dr. Hill referred to a case that he had operated on. Drs. Marschik and Broeckhaert spoke, and the latter suggested the possibility of the transpalatine route. Dr. Halle favoured rather the intranasal route of Hirsch. Dr. Westmacott (Manchester) thought the method of Hirsch limited to rhinologists.

DEMONSTRATIONS.

Dr. A. Gyergyai (Kolozsvár) explained a method for the direct examination of the naso-pharynx and Eustachian tube, which ıe illustrated by means of diagrams and a special instrument devised by himself.

Dr. Hoffmann (Dresden) read a paper on the anatomy of the inferior turbinate, which was mainly a description of some excellent lantern slides showing the structure of the mucous membrane and its relation to the venous sinuses underlying it.

OTOLOGY.

DISCUSSION ON THE PATHOLOGY OF ACQUIRED DEAF-MUTISM.

PROFESSOR ALFRED DENKER (Halle) opened this discussion with a lantern demonstration of specimens illustrating the pathological changes met with in the ears of deaf-mutes. He was followed by Professor Holger Mygind (Copenhagen), who presented conclusions based upon the published reports of the examination of petrous bones of deaf-mutes with acquired deafness. He had excluded a large number of cases, and had used only cases (1) which had been thoroughly investigated and fully described, or where at least the description justified the supposition that important anatomical changes had not been overlooked; (2) where the history of the case stated that the deafness had been acquired after birth; and (3) where the pathological changes described did not distinctly speak against the history of the case. The report was based upon 38 cases representing 75 petrous bones, as in one case only one side was examined. Amongst these cases there was not one in which the microscopical examination of the membranous labyrinth had yielded a negative result. In none of the cases of acquired deaf-mutism were abnormalities found in the cerebral part of the hearing apparatus which could be considered as causing the deafness. In cases in which there was no chronic suppuration the middle ear not infrequently contained residua of an inflammatory process in the shape of adhesive fibrous tissue, new formation of bony substance, or total or partial absence of the stapes, but in no case could the changes in the middle ear be considered as the immediate cause of the deafness. Deaf-mutism of tympanic origin was characterized by the presence of highly destructive processes in the middle ear or their residua, together with new formation of osseous or fibrous tissue in the labyrinth. Deaf-mutism caused by meningitis or other intracranial diseases was characterized by more considerable new formation in the internal ear, combined with a normal tympanic cavity, or with a tympanic cavity with moderate inflammatory alteration. Scarlet fever was more deleterious to the middle ear than measles, and the labyrinthine changes in deaf-mutism from measles were the result of a process less destructive than in cases of scarlatinal deaf-mutism. In cases of deaf-mutism of tympanic origin it was often difficult to find the route by which the inflammation had spread to the internal ear. In most cases of acquired deafness the changes found were macroscopic; in a few cases they were microscopic only, and in no case had a microscopical examination yielded a negative result. The vestibule was the part of the labyrinth least affected. In all cases except one the pathological changes were much more marked in the sacculus than in the utriculus. Macroscopical alterations of the semicircular canals were found with considerable greater frequency than of the vestibule, and with about the same frequency as in the cochlea. In a sentence, the superior part of the membranous labyrinth generally was less affected than the inferior. There was no decided evidence to answer the question as to the channel through which the labyrinth was generally secondarily affected. The acoustic nerve did not show a tendency to atrophy or to degenerate as a result of inactivity. No marked line could be drawn between the alterations found in acquired deaf-mutism and those described in some congenital cases, in which also the changes found were most naturally explained as being the results of fetal inflammatory processes. In conclusion, he said that the pathology of deaf-mutism acquired after birth was really the pathology of infantile labyrinthitis which had reached its final stage and caused lasting deafness.

The discussion was continued by Dr. Castex (Paris) and Professor Uchermann. The latter considered that Professor Mygind's final conclusion, that the pathology of deaf-mutism acquired after birth was "really" the pathology of infantile labyrinthitis, should have been worded "chiefly." He also considered that any changes in the brain were secondary to those in the ear, and due to diminished use and consequent defective development. Professor Brühl (Berlin) gave a demonstration of lantern photographs of pathological specimens bearing upon the subject. Professor Werner Kümmel (Heidelberg) and Professor Gustav Alexander (Vienna) also spoke.

Dr. Jobson Horne (London) expressed the opinion that meningitis—especially epidemic cerebro-spinal meningitis—and scarlet fever were more frequently the causes of acquired deaf-mutism than all other infectious diseases of childhood put together. At the same time he considered that mumps and hereditary syphilis as causative factors had not been taken sufficiently into account. For various reasons, which he stated, not a few of the so-called

acquired cases were due to direct heredity. Furthermore, a weakness or tendency to deafness was at times hereditary, and might become patent. Those were some of the difficulties to be contended with in arriving at a true estimate of the pathology of the cases of deaf-mutism alleged to have been acquired. Dr. Spira (Krakau) also spoke.

Discussion on the Climatic and Occupational Influences in Diseases of the Ear.

This discussion was opened by Dr. Clarence J. Blake (Boston, U.S.A.) and Professor Giuseppe Gradenigo (Turin). Dr. Blake said the influence of normal climatic changes upon diseases of the ear directly was slight, and was exerted principally through the medium of the associated organs, the nose and the naso-pharynx, or in participation with changes in a systemic condition. The influence of trades and occupations was much more pronounced, and was operative through the same media. "Welfare work" in connexion with manufactories was growing in vigour and in value with the increasing public appreciation of its importance, and was doing much to abolish prejudicial conditions; but there was one class of prejudicial occupational output, a by-product of mechanical industry, that was the most injurious of all, and one especially affecting the organ of hearing, and sometimes secondarily the organ of equilibration, which had been almost the last to receive welfare consideration, and that output was the deleterious effect produced by unnecessary noises. High grades of progressive impairment of hearing, presumably due to degenerative processes of the labyrinth, were more common among metal workers who were subjected to intense sounds made up largely of overtones of high pitch than among the workers in noises of lower pitch. Weavers in cotton mills, for example, and water tenders in paper mills were less subject to progressive impairment of hearing than were blacksmiths, boiler makers, button makers, metal stampers, and weavers. After reviewing the many climatic and occupational influences in diseases of the ear, including those induced by aviation, Professor Blake concluded his report by emphasizing the injurious effects of unnecessary noise. Those effects were no longer merely in the field of conjecture and clinical experience, but within the compass of little more than a decade they had been abundantly demonstrated by scientific research.

The President (Mr. Arthur Cheatle) spoke of the ear affections occasioned by flights in aeroplanes, and considered the matter required further investigation. He also commented upon a pilot being able to obtain his certificate without undergoing a medical examination.

Dr. Jobson Horne (London) discussed the ear affections caused by the telephone, the aeroplane, and the street traffic of the present day, all of which were the outcome of the application of science to modern life. Fortunately, the injurious effects of all three were due to causes which were in no small measure preventable. There was no evidence to show that the telephone *per se* was a cause of defective hearing, but the sudden and unnecessary adventitious sounds occasioned by defective apparatus and badly insulated wires were deleterious. Similar remarks were applicable to unnecessary noises occasioned by street traffic. The dizziness complained of at times by aviators he attributed to the vibrations of the engine. He summed up the harmful influences as due to the sudden and unexpected onset of noise rather than to its intensity and to sudden variations of atmospheric pressure together with the additional strain exerted generally upon the nervous system. The discussion was continued by Dr. Dan Mackenzie (London), Professor von Eicken (Giessen), Mr. Sidney Scott (London), Mr. H. Child (Exeter), Dr. Koenig and Dr. Maurice (Paris). Dr. Reik (Boston), who, in the unavoidable absence of Professor Blake, read the introductory report by the latter, in the course of his reply described many unnecessary noises which formed part of one's daily life in his own city.

Independent Papers.

The Surgical Treatment of Chronic Suppuration of the Ear.

Professor Gherardo Ferreri (Rome) read a paper on this subject, and the President (Mr. Arthur Cheatle) said that he formerly removed the ossicles in chronic suppuration, but that he had given up that treatment and regarded it as a waste of time. The ossicles might be left with safety at times in the mastoid operation. Dr. Dench (New York) was also opposed to ossiculectomy. In a very small percentage of cases did he find the hearing impaired after the radical mastoid operation. Professor Mygind considered that surgeons had to be optimistic, but that they were too optimistic as regards the hearing power after a mastoid operation. The subject was also discussed by Dr. Jansen (Berlin), Professor G. Alexander, and Professor Neumann (Vienna), and Mr. Ernest West and Mr. G. J. Jenkins (London).

Labyrinthine Nystagmus.

A joint paper, dealing with the mechanism of labyrinthine nystagmus and its modification by lesions in the cerebellum and cerebrum—an experimental investigation, by Dr. J. Gordon Wilson (Chicago) and Dr. F. H. Pike (New York), was read by the former. The paper discussed the typical form of labyrinthine nystagmus, which, it was said, consisted of a slow and of a quick phase. The slow phase could be elicited by stimulation of the labyrinth, independently of the cerebellum and cerebrum. The quick phase was independent of the cerebellum, and the paper discussed its cerebral connexions and the parts of the cerebrum essential for its production. The authors then contrasted labyrinthine nystagmus and the ocular movement following lesions of the cerebellum, and discussed how lesions of the vestibular tract and of the cerebellum modified the labyrinthine nystagmus, and how lesions of the cerebrum affected the nystagmus arising from lesions in or stimulation of the labyrinth.

Diseases of the Labyrinth.

At the morning session on Saturday, August 9th, the Section of Otology discussed non-suppurative diseases of the labyrinth, the reporters being Professor Gustav Alexander (Vienna) and Professor Karl von Eicken (Giessen). Professor Alexander also gave a demonstration of microscopic and macroscopic preparations bearing upon the subject. He was followed by Mr. J. S. Fraser (Edinburgh), who gave a similar demonstration. Dr. Nager (Zürich) demonstrated lantern photographs of histological specimens of influenzal labyrinthitis. Dr. E. B. Dench (New York) read a paper descriptive of two cases of sudden ablation of the labyrinthine function to the caloric test. In both cases the labyrinth, tested at intervals of twenty-four hours, showed a complete loss of caloric reaction. This seemed sufficient in both cases to warrant the complete labyrinth operation, and the findings at the operation clearly demonstrated the wisdom of such a procedure. In the first case a fistula was found in the horizontal semicircular canal, and the oval window was found open. In the second case infection of the labyrinth occurred secondarily to involvement of the sinus; the sinus thrombosis was apparently of long duration.

STOMATOLOGY.

Discussion on Reflex and Functional Disturbances in Connexion with the Teeth.

Dr. A. W. W. Baker (London) said that thirty-five years ago there was a strong belief that dental irritation was capable of causing many lesions in parts so remote from the teeth as to exclude the possibility of the direct extension of diseased conditions; reflex action was suggested as the only explanation. Further knowledge of pathology had shown that many of these cases were explicable on the grounds of toxic absorption; this was the view held by Mr. Colyer and Professor Pickerill. Nevertheless, an important residuum of cases remained which many writers agreed might be caused by dental irritation. In this category were placed epilepsy, chorea, hysteria, muscular spasm, and affections of the vasomotor secretory and motor nerves. The work of Dr. Head in mapping out areas of tenderness on the face and head associated with certain teeth had proved of great service. Not only could pain in the teeth be referred to other parts, but the reverse condition could happen. Odontalgia of a painful and often persistent character sometimes followed operations upon the nose. With regard to "teething" in young children there was some divergence of opinion, but most observers agreed in thinking that the irritation of

teething could cause disturbances of the general health; and Dr. Still in his book had given a list of conditions connected with teething. The rare condition called spasmus nutans was distinctly coincident with dentition in its onset and cessation. With regard to reflex irritation of the eye, many cases had been recorded in the past; but, as Sir William Collins had pointed out, with a more rigid method of observation and a more general use of the ophthalmoscope, the number of these cases had greatly diminished.

Dr. Rousseau-Decelle (Paris) thought that all dental lesions were capable of giving rise to reflex disturbances. He had often noticed hyperaesthesia of the skin of the face and head in cases of dental disease. Cutaneous lesions due to reflex irritation were common, and the association of alopecia with dental caries had been well established. The reason why these reflex disturbances occurred in some individuals and not in others was due to the condition of the nerve centres. A study of these cases often revealed some antecedent irritability which might be traceable to alcoholism, epilepsy, or syphilis. In nerve centres so weakened the tendency to reaction was great, and comparatively slight irritation might give rise to widespread nervous manifestations.

Professor Underwood related two cases that had come under his observation. In one, sciatica of long duration disappeared within a week of removing some decayed teeth.

Mr. Colyer said that with a better knowledge of pathology most of these cases of so-called reflex irritation had been transferred to their proper place as being due to sepsis. He thought that undoubtedly Professor Underwood's case came under that category. Teething, however, was responsible for some cases of general disturbance in children. He did not see how iritis could be caused by a reflex irritation, but he could readily understand such a condition being caused by septic absorption from the mouth.

Mr. J. G. Turner said that reflex irritation was like the Mahatmas of Thibet. When a case was sought for, it disappeared. With regard to teething, he had found that there was least irritation when the mothers had been careful to clean the bottle.

Drs. Coopman (Belgium), Cruet, Delguel, Amoedo, and Marques (Lisbon) continued the discussion, and Drs. Baker and Rousseau-Decelle replied.

INDEPENDENT PAPERS.

The Preparation of the Mouth for Surgical Operations.

Mr. H. Lloyd Williams (London) said that failure to produce favourable conditions in the mouth was followed, as elsewhere, by sepsis and secondary haemorrhage. Septic infection of the bone of the socket was frequently seen after extraction. The cause was to be found in the septic condition of the mouth at the time of operation. Before extraction the teeth should be carefully scaled and the gums wiped over with hydrogen peroxide (10 per cent.). In this way a dirty mouth could be made clean in a comparatively short space of time. It was important in treating fractures of the jaw to get the mouth as clean as possible by extracting septic teeth and roots in the neighbourhood of the fracture. Again, the mouth should be cleaned thoroughly before operations involving the adjacent and communicating cavities. The importance of a clean mouth before performing gastric intestinal operations was obvious.

Surgical Prosthesis.

Mr. Sheridan (Dublin) and Dr. Boerma (Holland) read papers on surgical prosthesis. Dr. Aguilar (Madrid) said that to be effective surgical prosthesis should be immediate—that is to say, the apparatus should be inserted after the removal of the bone and before the suturing of the skin. He had restored portions of the mandible in this way with satisfactory results. In one case the patient had worn the apparatus for two years.

CLINICAL DEMONSTRATION.

Cases illustrating deformities of the jaw in children, malignant disease of the mouth, and arthritis due to oral sepsis were shown, while Mr. Goadby exhibited some cultures of mouth organisms, and some rabbits in which he had produced experimental arthritis by the inoculation of pure culture of the *Streptobacillus malae*.

HYGIENE AND PREVENTIVE MEDICINE.

INFANT MORTALITY.

ON Friday morning the Section held a joint discussion with the Sections of Obstetrics and Gynaecology, and of Diseases of Children, on the subject of infant mortality. It was reported in detail at page 402 of our issue for August 16th. From the point of view of preventive medicine the most important conclusion reached seemed to be a general consensus of opinion that "prematurity," including under that head such conditions as premature birth, congenital defects, atelectasis, atrophy, etc., was one of the chief causes of high infantile mortality in the first four weeks of life, and following upon this, a conviction that greater attention should be given to the coming generation in the prenatal period. The remedies suggested in this connexion were: Observation and examination and, if necessary, treatment or detention in hospital of all women suspected of having syphilis, or deformities, such as contracted pelvis; notification of all cases of pregnancy, withdrawal of pregnant women from the labour market; education of women and girls, "prospective mothers," as to the duties and responsibilities of motherhood; avoidance of meddlesome midwifery, the encouragement of breast-feeding, and when this was impossible, an organized system of wet-nursing.

EPIDEMIOLOGY.

At the meeting on August 9th, Dr. W. H. Hamer in the chair, a discussion on the factors that determine the rise, spread, and degree of severity of epidemic diseases was opened by Dr. Major Greenwood, jun., Lister Institute of Preventive Medicine, who first gave a brief historic summary of the subject, describing the classical conceptions of epidemics from Hippocrates to Sydenham. He summarized the teaching of Sydenham as follows:

> An epidemic should be regarded from three points of view: (1) That there is a process of secular or long-period modification, in virtue of which a specific type becomes dominant in a particular epoch, and then gradually or suddenly gives place to a rival. (2) There is another set of factors producing short-period oscillations in the epidemicity of a given disease leading to the phenomena of seasonal prevalence. (3) Finally, we can connect these two trains of ideas by the conception of an epidemic constitution in virtue of which certain types of epidemic or certain features of morbidity tend to prevail at a given time to the exclusion of other types or symptoms. We may say that the amplitude of the first kind of wave is measured in centuries, that of the second in months, and that of the last in years.

Dr. Greenwood next traced the history of scarlet fever epidemics during the last hundred years, which showed evidence of a wide prevalence and high fatality at the commencement of the nineteenth century, followed by a remission, then succeeded by a period of gravity in the years 1830–40, which he termed the "golden age" of scarlet fever. That culminated between 1862 and 1865, followed by a remission. Then occurred a less marked rise in 1868–71, followed by another smaller rise; and from the year 1877 onwards there had been a continuous downward trend, disturbed only by occasional small ripples. With regard to the causes of such variations, he advanced the following propositions:

1. Secular variations were too striking to be attributed wholly to errors of record, although in this particular case of scarlet fever the early history of the disease could not be separated from that of diphtheria.
2. Such variations might be due to the action of natural selection operating upon variations of human resisting power, or upon the biological characters of the causative agent, or by a combination of both processes.
3. The direct action of public health authorities might have played an important part in bringing about the decline in prevalence and fatality of the disease. In this connexion, however, it should be remembered that the present decline had begun to be apparent before the initiation of modern hygiene.

With regard to the course of an epidemic, he suggested that laws descriptive of it might ultimately be propounded. One factor in the evolution of an epidemic was likely to be found in changes taking place in the infecting organism, as a consequence of which the latter's power of infecting susceptible subjects was a function of the time. In the case of certain diseases it was probable that the influence of such extrinsic factors as temperature was of

great importance in determining the course of an epidemic. The paper concluded with a description of the method of fitting of "frequency curves" to statistics.

The second reporter was Professor Dr. G. Sticker (Bonn), who said that the best known examples—influenza, plague, cholera—had shown that to discover the conditions of parasitic epidemics one must avoid all generalization, and study each malady by itself and in its environment, historically, geographically, biologically, nosographically, experimentally—in short, scientifically. It was never enough to consider it from an anthropocentric standpoint as only a human disorder, but that for the advance of epidemiology a higher standpoint—that of the loimologist—was necessary. The loimology of the future had for its object to discover what places and what times were favourable to each epidemic disease and what unfavourable, either continuously or for a time; whether and how far animals and plants took part as victims or as carriers of the germ of the human disease; where the original nidus of the germ lay hidden, what was its importer, whether there were animal or vegetable or lifeless undercarriers or intermediaries; whether the disease was spread by hosts which were themselves healthy or by lifeless material; what other epidemic disorders were either occasionally or regularly connected with the parasitic epidemics so as to aid their progress or increase their severity and to influence the severity of the several diseases.

Dr. John Brownlee (Glasgow) brought forward his interesting theory that the rise and fall of epidemics obeyed the laws of geometrical progression. This he illustrated in a graphic manner by diagrams. His chief conclusions on the subject were: (1) That an epidemic was an organic phenomenon caused by the organism becoming suddenly infective and thereafter losing its infectivity at a rate approximating to a geometrical progression. (2) That the progress of an epidemic might be due to the above process acting either directly or indirectly; directly, as an epidemic of small-pox, when the infection passed from one person to another; indirectly, as an epidemic of malaria, when the number of mosquitos rose and fell according to approximately the same law. (3) That it was probable that the epidemic ended because of loss of infectivity on the part of the infected organism rather than because of a change in susceptibility of individuals towards the organism, as epidemics of the same disease often ran identical courses whether occurring in winter or in summer. (4) With regard to summer diarrhoea, it was evident that the type of epidemic was to a certain degree fixed before the onset, and that it was only secondarily modified by the climate. (5) That the date of the epidemic was determined (*a*) by the date of the epidemic in the previous year, (*b*) by the temperature in the month of June, and (*c*) by the amount of rainfall in the month of June. (6) That the amount of the epidemic was determined chiefly by the temperature in the month of June.

Dr. W. H. Hamer said that he had been much struck by a suggestion thrown out by Dr. Greenwood as to whether the infecting organism in milder epidemics might not be the real lion at all, but only a jackal, and therefore incapable of doing so much damage. His experience of a couple of small epidemics that had occurred in London led him to the same conclusion. One was limited to a few cases of cerebro-spinal fever which were imported from the Continent, where the disease was raging, but it made no headway in this country. Another was an epidemic of rat plague, in which the plague bacillus was isolated; but the remarkable limitation of the infection to a few rats in London raised the question whether in this instance it was the real organism at all which caused the rat plague. The fact of the rarity of cases of glanders occurring in human beings pointed in the same direction.

Dr. Jamieson (Melbourne, Australia) referred to the great reduction that had taken place in Melbourne in the mortality from typhoid fever during the last twenty years or so. The mortality was now reduced to one-tenth of what it had been in the period referred to, owing to the adoption of modern drainage systems.

Dr. E. W. Goodall (Homerton) dwelt on the great decline of severe cases of scarlet fever during the last twenty years. The death-rate had been reduced from 3.6 to 0.22, and the percentage of cases of scarlatina anginosa from 15.1 to 2.9. Typhoid fever and measles had not declined to the same extent, but the death-rate from the streptococcal diseases—erysipelas, pyrexia, and puerperal fever—had also diminished. The conclusion he came to was that alterations in the severity of these diseases depended on alterations in the virulence of the micro-organisms. In his opinion the severe throat symptoms of scarlet fever were due to streptococcal infection, and not to the specific organism of the disease, whatever it might be, and the decline of mortality and of anginous cases was on all-fours with that obtaining in other diseases caused by streptococci, although the factor of variations in human resisting power must also be taken into consideration.

The discussion was continued by Dr. Ledingham, who dealt with the question from the bacteriological point of view, and by Professor Sudhoff (Leipzig).

Dr. Bond (M.O.H., Holborn) brought forward the view that diminution in the fatality of epidemics was due to increased urbanization, from which increased opportunities of infection occurred, with the result that the majority of the population were protected by going through mild attacks. He believed this was notably the case with regard to tuberculosis.

Dr. Keith (Singapore) differed from Professor Sticker's views as to the maturation of cholera germs in the soil. He quoted instances in his experience proving that the disease was transmitted by "carriers."

Dr. Greenwood and Professor Sticker replied to the various points raised by the discussion.

Visual Defects in School Children.

At the last meeting of the Section the chair was taken by Dr. W. Leslie Mackenzie, medical member of the Local Government Board, Scotland.

Dr. James Kerr (Principal School Medical Officer, London County Council), in introducing a discussion on the causes, prevention, and treatment of visual defects in school children, regretted that this discussion had not been arranged in conjunction with the Section of Ophthalmology, as the subject was one of great interest to eye specialists. He dealt chiefly with low-grade myopia, by which he meant myopia of less than 3 dioptres, and there was no doubt this was associated with school conditions, especially eyestrain from close work, particularly in bad light, debility from unhealthy rooms, and illness or malnutrition. He characterized the work done in school, even in early years, as strangely unsuitable. The educational system had not been built upon scientific lines, but had survived from the literary and clerical schools of the Middle Ages, when reading and writing to understand the services of the Church were the highest aims. There was too much of a literary aspect in the early years of schooling, and children were taught to deal with the symbols of things rather than with the things themselves. The learning of letter forms ought to be almost entirely muscular, and very large letters should be used. Fine writing copies and writing books with small-spaced lines and intervals should be excluded from the school which sought good ocular hygiene. The elements of writing should be learnt as coarse muscular exercises with chalk and blackboard, the child standing with outstretched arm and making large, free, rapid strokes. No precision or slow accuracy in detail should be expected, only rapidity and general legibility. The object of all this was to minimize the use of vision, and in his opinion the near-eye-work habit, now almost universally encouraged in schools, was the pivot on which so many questions of school hygiene converged. If that could be eliminated from the early years of school life, all the great discussions on school desks, vertical or oblique handwriting, *et hoc genus omne*, could be pushed to one side. It was most important also to avoid fatigue in every way. With regard to the size of letters, he would stipulate that no child learning letters—that is, up to the age of 7 years—should have type with letters less than 2 mm. high. From 7 to 9 the type might be 1.75 mm. and above that age 1.5 mm. high for small letters. With regard to other points, he was satisfied with the proportions of most modern seats and desks. Effective ventilation and sufficient desk width could not be obtained with less than 15 square ft. per head. The allowance for elementary classrooms of 10 square feet was too low. Illumination by daylight should be efficient, and arranged to come from

the left side; and for artificial illumination no school desk should have less than 2.5 foot candles. It was also of considerable importance to protect the eyes from glare and shine. These were the chief points emphasized with regard to the school prophylaxis of low-grade myopia. In dealing with higher degrees of myopia, what they wanted was protection during the growing period. He had devised what was known as the high myopia school, which was a method of eliminating eye work as far as possible from elementary education. That method had been found so successful that it was being extended, and applied to other rarer varieties of eye disease or malformation as well as to high myopia. In conclusion, realizing the dangers of literary careers for sufferers from myopia, he would like to see a stringent rule made to refuse scholarships to young myopes of 4 dioptres or more, and all candidates for the teaching profession should be rejected for myopia of 6 dioptres or over.

The second reporter was Professor R. Posseck (Graz), who considered that the chief cause of defect of sight in school children was myopia, which developed indirectly from the nearness of the work in school time. According to Levinsohn's observations, which the reporter could confirm, it was the bending of the head which produced in the eyes by the force of gravitation a traction on the hinder quadrant of the eye. On that account it was necessary to prevent everything that led to bending of the head. As well as avoiding every difficulty which led to a shortening of the work distance, such as bad lighting, small print, unsuitable seats, etc., it was most important to introduce a greater angular elevation of the desk table. Accurate medical control by specially trained school doctors, and early correction for myopes, was insisted on.

Dr. L. A. Parry (Hove) thought it was essential that school medical officers should have a training in diseases of the eye. He did not think that Dr. Kerr had laid sufficient stress on the importance of arranging that school desks should be lighted from the left side. In his opinion this was most urgent. He also advocated full correction of myopia. He would like to insist on all members of education committees having to pass an examination in hygiene. Dr. Hans Lauber (Vienna) laid stress on the development of myopia during the period of rapid growth, and on the importance of special attention being paid by teachers and parents to the eyesight of children whose growth was more rapid than usual. In his opinion Professor Posseck's anatomical theory was not properly supported. Professor Georg Levinsohn (Berlin) followed with an exposition of his theory of the causation of myopia. This was, briefly, that the eye, through the bending of the trunk and head during close working, was drawn down by gravity, the optic nerve and the muscles and various coats of the eye were stretched, so as to produce a lengthening of the eyeball and consequent myopia. In experiments on young rabbits, cats, and dogs by suspending them head downwards for several hours daily, he had succeeded in considerably augmenting their refraction. To obviate that cause of myopia, treatment should be directed to explaining in school the harmful effects of bending the trunk and head, providing proper school desks which encouraged an upright position, and introducing straight writing. Mr. Ernest Clarke (London) believed that excess of convergence over accommodation was what produced the mischief in myopia, and insisted on the necessity of full correction in myopia. In his opinion, school myopia was engendered by close work, and he urged the necessity of doing away with evening preparation at private and better-class schools. Another thing that should be discouraged by parents in private life was allowing little girls to do fine needlework. The next speaker, Professor Ralph Williams (Sheffield), also condemned fine sewing by girls, and all such kindergarten work as threading beads, pricking outlines of animals, etc. He handed round a specimen of the kind of coarse needlework which he thought suitable for young girls, and expressed his belief that one cause of the greater incidence of myopia in girls was their being encouraged in needlework.

Dr. Brindley James (London) objected to electric light on the ground that it gave a feebler illumination than gas, and Dr. Leslie Mackenzie objected to it on the opposite grounds—namely, that the light was too powerful and over-stimulated the retina. In his opinion, based on personal experience and on the views of an eminent expert, the best light for reading by at night was a paraffin candle.

In replying on the discussion, Dr. Kerr agreed that electric light contained rays which were peculiarly irritating to the retina, but thought this question was one of physiological adaptation of the eye. He considered Dr. Levinsohn's theory to be one of very great importance, though it did not contain the whole truth. When he was in Bradford people with myopia used to tell him that they were "slack set up," and he thought it would be hard to find a more expressive way of explaining the condition referred to.

Independent Papers.

Registration of Stillbirths.

On Friday afternoon the first paper was read by Dr. Reginald Dudfield on the registration of stillbirths. Having shown by statistical tables that there had been a considerable reduction in infantile mortality during the last ten years, he said the conclusion was irresistible that this reduction had been effected by preventive measures affecting post-natal causes of death, while leaving ante-natal causes practically uninfluenced up to the present. He believed that the best hope of success in combating this state of affairs lay in the study of the causes producing stillbirth, for which purpose the compulsory registration of such births was absolutely essential. Such study should be extended to the statistics of other countries, and the first step should be a proper definition of the term "stillbirth." He suggested the following tentative definition:

> A stillborn child means a child whose body at birth measures not less than 13 in. (32 cm.) in length from the crown of the head to the sole of the feet, and who, when born (the head, body, and limbs of the child, but not necessarily the afterbirth, being extruded from the body of the mother), exhibits no sign of life—that is to say, whose heart has ceased to function, as demonstrated by the absence of pulsation in the cord at its attachment to the body of the child, and absence of heart sounds and impulses.

Used at the instant of complete birth, that test was one which a properly trained midwife should be able to apply, and it should not be beyond the skill of most lay assistants. If all countries could be induced to fix the same time, namely, the end of the twenty-eighth week of gestation, for the inception of registration, a large body of valuable data of a comparable character would be available. The speaker also indicated briefly the practice as to registration of stillbirths existing in other countries, and said that registration should provide for the declaration of the causes of death *in utero*, and that a special register of stillbirths should be provided.

Laryngeal Diphtheria.

Professor Alfonso Montefusco (Naples) read a paper on the diffusion of croup at Naples. He did not define croup, but apparently he meant by the term what is usually called in this country laryngeal diphtheria. There appeared to be nothing very striking about the incidence of the disease at Naples, except, perhaps, the fact that he found it to be more frequent in the country than in the town. The incidence of the disease was greater among males than females, but the mortality was the other way about—greatest in females.

Eugenics.

A paper having eugenics as its basis was read by Dr. E. Deutsch (Budapest) under the title, the social and hygienic care of abnormal children. In his opinion, consanguinity of parents had no bad effects, except in the case of retinitis pigmentosa and congenital deaf-mutism, in which diseases, however, hereditary transmission played the chief rôle and consanguinity only a minor part. He had personally examined 1,011 families, and from data thus obtained he concluded that poisoning of the germ cells by alcohol, tuberculosis, syphilis, malaria, lead, and morphine was the cause of various degenerations among children. As methods of prophylaxis, he suggested: (1) Rational pairing of men and women; (2) forbidding of marriage of abnormal subjects; (3) sterilization of the unfit; (4) segregation of unfit; (5) campaign against alcoholism and insistence on abstinence in children, temperance in adults; (6) syphilitics should not be allowed to marry without medical consent; (7) conception should be

prevented in the case of tuberculous women; (8) morphinomaniacs should not be allowed to marry; (9) quinine treatment in chronic malaria; (10) medical inspectors appointed by the State to carry out regulations against lead poisoning in various trades. The paper was discussed by Professor Sticker and Dr. Greenwood.

Tuberculosis in the Tropics.

Dr. Gedeon Biro (Budapest), having read a short paper advocating teaching in open-air schools,

Dr. Angus Macdonald (Jamaica) followed with a paper on preventive control of tuberculosis in the tropics. From this it appeared that, except in Australia, where the rate was only 1 per 1,000, and in Grenada 0.5 per 1,000, the death-rate from all forms of tuberculosis was considerably higher in most tropical countries than in the British Isles, ranging from 3.4 per 1,000 in Jamaica and Ceylon to about 5 per 1,000 in Trinidad and British Guiana.

There were certain different features found in the disease in the tropics. Thus death under 1 year was rare, and under 5 uncommon, and pulmonary tuberculosis caused 84 per cent. of deaths, other forms only 16 per cent., pointing to the comparative rarity of bovine tuberculosis.

Occupation played little part in the extension of the disease. Food infection had little or no effect, as tuberculous meat was rare, and milk was practically always boiled and consumed in relatively small amount. Climate as a causative factor was not statistically evidenced, the mortality-rate in the damp and relaxing climate of Grenada being 0.5 per 1,000, while it stood at 3.4 in dry and bracing Kingston. Evidence from everywhere pointed to tuberculosis being a disease almost entirely of domesticity. The wretched hovels of the people, the overcrowding of rooms at night, the closing of doors and windows and stopping of every chink, absence of ventilation and fear of night air, the fatalism of the people—all these features in tropical life enhanced the opportunity of infection and made inevitable direct communication of the disease from an affected person to all within striking range.

With regard to prevention and treatment, the same measures should be taken as were being made use of at home, especially compulsory notification and tuberculosis schools, where isolation could be practically carried out and its inculcation so established as to have patients coming back to their homes active apostles of hygiene.

Many efforts in these directions had been made in different parts, notably in Trinidad, but much of the good of those efforts was lost through want of co-ordination in administration.

In conclusion, Dr. Macdonald emphasized the fact that in studying statistics it was remarkable that the chief causes of death in the tropics, far from being purely tropical diseases, were the time-honoured diseases of civilization.

Support of Hospitals.

Dr. J. C. McWalter (Dublin) put in a paper on the necessity for State-endowed hospitals and a State medical service, in which he advocated the plan of the State handing over to the trustees of a hospital a certain sum per day for every patient occupying a bed. He also thought that the present ill-organized crowd of 14,000 doctors who now administered the Insurance Act could not be allowed to continue their labours without being digested into a more uniform organism, which ought to be a State medical service.

Prevention of Disease.

The business of the meeting concluded with a very long paper by Dr. A. L. Soresi (New York), the gist of which was that the problem of prevention of disease was more a social than a medical one, and that medical science would never be able to prevent the existence of infectious diseases until social science had been able to eliminate the conditions which created the favourable ground where infectious diseases grew and multiplied.

On the proposal of Dr. Gedeon Biro (Budapest), a resolution was passed by the Section to the effect that it was advisable to extend and further in every way possible the teaching of children in open-air schools.

NAVAL AND MILITARY MEDICINE.

PREVENTION OF MALARIA AMONG TROOPS.

AT the meeting of the Section on Saturday Colonel P. Hehir, I.M.S., read a paper on the prevention of malaria among troops in India, in which he enumerated the measures generally employed to prevent the breeding of mosquitos. He also stated that in his opinion the prophylactic administration of quinine was of great value in preventing the occurrence of malaria.

DISCUSSION ON HOSPITAL SHIPS AND THE TRANSPORT OF WOUNDED.

Surgeon-Inspector I. Nishi (Imperial Japanese Navy), in introducing this subject, divided the functions of a hospital ship into those which are performed in peace and those demanded of it in time of war. In the former category he mentioned the treatment of sick received from various vessels on foreign stations, and their conveyance. In war the duties of a hospital ship were multifarious, comprising not only the collection of wounded from the various battleships, their treatment, and transport to home territory, but also the supply of medical stores to war ships remote from the base, the provision of the necessary laboratories for chemical, physical, and bacteriological research, and the disinfection of smaller vessels which possess no disinfecting plant of their own. The ideal hospital ship would not differ from the ideal hospital on land, except that it was afloat. That ideal could only be attained by means of a ship specially designed for the purpose by an expert naval architect and a medical man working together in complete harmony, and was hardly practical in view of the expense entailed. It was necessary, therefore, to rely on merchant ships adapted for the purpose. The most important points to be kept in mind in selecting such a ship were that it should be steady, should have a large space on the hurricane deck to serve as a promenade for the patients, that passages from one compartment to another on the same deck should be wide and the incline of the companions not too steep. There should be a number of rooms, large and small, in the middle part of the upper deck, where motion and vibration were reduced to a minimum, convertible into wards. The interior should be free from ornamentation and similar "dust traps." The operating theatre and its adjuncts, the laboratories, wards, and, in fact, all those departments of the hospital used for the actual treatment of sick or the performance of expert medical and surgical work, should be in and above the middle part of the middle deck. The laundry, drying-room, steam disinfector, mortuary, and animal-room might be either in the fore or after part of the ship. The quarters for the crew, etc., spare wards, canteen, and store-rooms would be on the lower deck. Wireless apparatus should always be carried. All cleaning should be done by the vacuum system. All auxiliary machinery should as far as possible be worked by electric motors to avoid useless distribution of heat by steam pipes in the sick-rooms. Finally, the ship should be capable of a high speed. As regards the transport of wounded, Surgeon-Inspector Nishi said that under brisk shell fire carriage by hand was the only practicable method. In the Japanese navy this was practised with one or more bearers, the methods approximating fairly closely to those in use in Great Britain. In a novel method devised by Surgeon-General Kimura the patient sits on the centre of a four-tailed band of strong cloth. The tails were tied together and passed round the necks of two bearers, one of whom walked on either side of the patient and supported him by their arms behind his back. The speaker preferred the simpler forms of stretchers, such as the bamboo blind stretcher devised by Baron Surgeon-General Totsuka, to more elaborate contrivances.

Fleet Surgeon McNabb, while maintaining that the hospital ship must now be accepted as a factor in the equipment of a fleet both in peace and war, dismissed as an unattainable ideal the specially designed ship. He would prefer a well built cargo boat of between 6,000 and 8,000 tons gross, with a speed of 12 to 14 knots, and accommodation for 300 to 400 patients. The ship should be roomy, and well ballasted, so as to be steady in a sea way. A cargo boat was designed to run with a full load, and the fact of her being run only half full might seriously affect her structure. A large fuel capacity was advisable

to avoid frequent coaling, and for this reason oil fuel would be preferable. Special attention should be paid to the lighting and ventilation of the wards, which should preferably run from side to side of the ship. The water supply should be ample, and in case of doubt as to its quality, filters should be provided for all the wards. A refrigerating plant should be carried, and lifts for moving wounded from deck to deck would be of the greatest value.

Generale-Medico Comm. Calcagno, of the Italian Navy, gave a short account of the hospital ships used during the expedition to Tripoli. Two of these, the *Re d'Italia* and the *Regina d'Italia*, were of 10,000 tons burden, with a speed of 15 knots. The equipment included stills, refrigerators, etc., and the ships were coaled, watered, and provisioned for two months. The carrying capacity was 2,000 patients. The sleeping cabins for emigrants were converted into spacious wards, the number of beds being reduced from 1,800 to 750 to provide ample room. The deck infirmary for emigrants was utilized as an officers' hospital. The equipment for operations, examinations, etc., was thoroughly up to date. Up to September, 1912—that is, the end of the war—22,400 invalids were transported to the home country, 4,000 of whom were suffering from severe injuries. In spite of great difficulties resulting from the stormy sea and the dangerous nature of the coast, the results achieved were extremely good. Operations of the most difficult nature were performed even in stormy weather. The stretchers used were the British pattern, modified by Colonel Rosati, and adapted to the Italian system of portable litters. These possessed the important qualities of simplicity, lightness, strength, and moderate cost.

Discussion on Water Supply in the Field.

This subject was introduced by Regimentsarzt Dr. Zoltan v. Ajkay, of the Royal Hungarian Army, in any extremely valuable paper. After enumerating the different sources from which water is procured in the field, and the various advantages and disadvantages of each, the speaker passed to a consideration of the various methods employed at different times for purification—namely, filtration, the addition of chemicals, use of ozone, exposure to ultra-violet rays, and boiling, and summed up as follows: (1) The water carried by each man in his bottle is neither reliable in quality nor sufficient in quantity. Some method of treatment is therefore essential to render it germ-free. (2) Filters are not reliable, rapidly get out of order, and are difficult of transport. Chemicals merely improve the taste of the water, as no chemical agent could be relied on to kill noxious germs rapidly. If small quantities were allowed to act for a short time the action was uncertain; larger quantities and longer exposure led to alterations in the chemical character of the water. (3) Ozonization and the exposure to the ultra-violet rays seemed promising, but in either case clarification was necessary to ensure success. So far neither of these methods was applicable in the field, as both required skilled mechanics, a constant supply of electricity, and apparatus too heavy for transport, especially on bad roads. Improvements of a technical nature might remove these objections. (4) Boiling was the most reliable method of sterilizing water in the field, and the Hartmann portable apparatus was a satisfactory means of solving the problem. Battalions and detached companies could be equipped with these, whilst smaller parties should be supplied with a smaller pattern. The larger pattern should be supplied to dressing stations, and the smaller to the advanced aid stations.

Colonel Horrocks reviewed briefly the various systems and methods used in the British army, pointing out that a distinction must be made between the troops at the front and those on the lines of communication, which were more or less stationary. Various types of heat-exchange apparatus had been experimented with in which the temperature was not allowed to rise above 80° C. The results were not on the whole favourable. Fuel was not always obtainable, and the effect of transport over bad ground was to damage the mechanism, and to repair it a skilled mechanic was needed. The most satisfactory results had been obtained by pumping the water, to which alum had been previously added, from the source through a box containing alum and chloride of lime, and then through a specially woven cloth wrapped round a wire cylinder. A thick film of mud was deposited on the cloth, and by this means from 60 to 90 per cent. of the bacteria could be removed. The clarified water could now be passed through Berkefeld candles, which must from time to time be sterilized and cleaned. Candles had the defect of being fragile and developing flaws in consequence of rough treatment, but it was simpler to carry spare candles than to repair a heat-exchange apparatus which had broken down from jolting. By the means of such an apparatus pure water could be supplied much more rapidly than when a heat-exchange apparatus was used.

Discussion on Anti-typhoid Inoculation.

Professor M. H. Vincent, Médecin Principal of the Val-de-Grâce Hospital, in opening the discussion, referred to the fact that antityphoid inoculation was practised for the first time on man by Pfeiffer and Kolle and Wright in 1896, and had since then been widely and successfully used. The results obtained in France were as gratifying as in other countries. A special laboratory had been opened at Val-de-Grâce, from which enough vaccine had been dispatched for 280,000 inoculations, the number actually vaccinated being probably above 100,000. The vaccine was polyvalent, raised from various strains of bacilli, and was sterilized by the addition of ether. It contained no antiseptic when actually sent out for use. The dosage strength was equivalent to 400 million bacilli per cubic centimetre. It could be used in combination with an antiparatyphoid vaccine prepared in the same manner. Vaccination was optional in the French Army, but 53,157 men had submitted to the operation. The proportion of vaccinated to non-vaccinated was 1 to 4 in Tunis and Algeria, and 1 to 6 in Eastern Morocco. In Western Morocco, on the other hand, out of 17,087 men 10,794 were protected in this manner. A considerable proportion of the civil population in seriously affected districts had also been vaccinated. Local reaction was absent or slight, very rarely severe. In healthy subjects a temperature of 102° F. was noted in 1.5 per cent. of cases, lasting only a short time. In 3 per cent. a temperature of 100.4° was observed. Malarious subjects frequently suffered from an attack of ague after inoculation. People who were ill, convalescent, or anaemic, and those who had previously suffered from typhoid fever, should not be vaccinated. In some cases, owing to accident, doses as high as 20 c.cm. had been administered; fever, headache, and local pain resulted, but no really serious permanent effect was produced. The following results had been noted: At Avignon, where a very severe epidemic raged amongst the civil population, 1,366 soldiers out of a total strength of 2,053 were vaccinated. There were in the garrison 155 cases of typhoid fever and 22 deaths, all amongst the 687 unprotected men. None of those vaccinated suffered from even slight fever. In Eastern Morocco, amongst 962 vaccinated men there was no case of infection, whereas amongst the non-vaccinated the morbidity was 38.22, and the mortality 5.51 per 1,000. In Western Morocco, where the men went through an extremely arduous campaign, the admission-rate amongst the vaccinated was 0.18 and the death-rate 0.09 per 1,000. The corresponding figures for the non-vaccinated were 168.44 and 21.13 respectively. It might fairly be estimated that as a result of vaccination the country had been spared over 2,000 cases of typhoid fever and 266 deaths from this disease.

Major Russell, of the Medical Corps, U.S. Army, referred to the severe outbreaks of typhoid fever that occurred in the various military camps during the Spanish war of 1898, and also in other campaigns, as showing the loss experienced in war from this cause. He then briefly sketched the history of antityphoid vaccination in the United States army, and described the process of manufacture, which approximates closely to that practised at the Royal Army Medical College. The first beginning was made in 1909, and though only 1,887 men were vaccinated in that year, in 1910 16,073 volunteered for the operation, and the numbers showed signs of increase in the following year. In the spring of 1911 orders were issued for the concentration of troops on the Mexican frontier, and compulsory vaccination was instituted on March 9th, for the troops forming the manœuvre camps. On June 9th it was made compulsory on all recruits. The following figures showed the contrast between the state of affairs in the Spanish war and that in 1911. At Jacksonville, in Florida,

in the earlier campaign there occurred certainly 1,729 and probably 2,673 cases of typhoid fever with 248 deaths. The strength of the force was 10,759. At San Antonio in 1911 a slightly larger force (13,000 men) was encamped for about the same length of time, and in this there were only 2 cases and no deaths, though enteric fever was actually present in the civil population of San Antonio, and the troops were allowed to enter the town freely. In the army as a whole a great drop had occurred in the incidence of typhoid fever since inoculation had been made compulsory. Severe reactions occurred in 1 to 3 persons in 1,000. Major Russell discussed shortly the relative advantages of living and dead vaccines, and concluded that for service use the former were unsuitable. The chief defect was instability, and their use was not unattended with danger. As regards the inoculation of the civil population, he thought that all people actually coming into contact with the disease should be protected, including the relatives and servants of patients. In isolated communities where the typhoid-rate was high, mining towns, lumber camps, many workhouses, asylums, and schools, the measure would be most beneficial.

Colonel Sir William Leishman limited himself, owing to the wide range of the subject, to a consideration of certain points interesting from the military standpoint, and especially affecting the British army. He advocated the use of a strain of low virulence, not being convinced that a strain of high virulence created a more effective protection—a quality which did not depend entirely on this peculiar characteristic only. In the same way he was not prepared to accept the argument that a polyvalent vaccine was more efficacious than the monovalent preparation in use at the Royal Army Medical College, and pointed to the remarkable uniformity of the results obtained by this vaccine in climates differing so widely as those of India, South Africa, and the West Indies. He preferred a vaccine prepared from a broth culture to one manufactured from a broth on a solid medium, owing to the technical advantages presented by the former method when production on a large scale was intended. He considered the temperature at which sterilization was effected a point of great importance, and that the disappointing results at one time met with by Wright were due to the use of too high a temperature for sterilization, combined with the addition of the preservative antiseptic to the vaccine before the fluid had been permitted to cool. Standardization was best achieved by a bacterial count, and the uniformity of the reaction produced was a fair proof of this. Individual susceptibility could, unfortunately, not be determined, and a previous analytical test of the blood, to ascertaining and guard against this peculiarity, was hardly feasible in practice. The keeping quality of the vaccine was a matter of great importance in the case of the British army in consequence of the number of tropical stations to which the vaccine had to be sent. Little if any change could, however, be ascertained even in vaccines which had been stored for six months at tropical temperatures. To be on the safe side a limit of three months was imposed, all vaccine of a greater age than this being destroyed. The dosage had remained unaltered for the last seven years. The rule was to give two doses, the first containing 500 million the second 1,000 million bacteria, at intervals of ten days. He did not think that a third dose would materially improve the immunity, and it would certainly affect the number of men volunteering for inoculation. Reaction was rarely severe, and though for military reasons it would be an advantage on mobilization to procure a vaccine that would cause no danger of incapacitation for even a short period, there was always the danger that this might be accompanied by a loss of protective power. He considered that the average duration of the protection conferred by the vaccine used was two years, after which reinoculation (one dose of 1,000 million) should be performed. He did not consider the so-called "negative phase" need be regarded as seriously affecting the value of the vaccine, and pointed to the fact that in the case of men who had been vaccinated in the stations where the disease was endemic, no proof existed that any increased susceptibility had resulted. The introduction of antityphoid inoculation had been followed by a striking decrease in the incidence of typhoid fever in India. In conclusion he submitted that the protective power of antityphoid inoculation could no longer be considered a matter for debate. Its existence had been proved, and he thought it should no longer be left to the individual soldier to say whether he wished to be inoculated or whether he preferred to run the risk of spreading infection broadcast amongst his comrades at a time when every rifle lost to the firing line might be a matter of importance to his country.

Professor Rodet wished to proclaim the utility of serum-therapy in the treatment of typhoid fever. He had records of 200 cases, and a good result was to be expected if only the treatment was applied early, before the tenth or eleventh day of disease. His figures were characterized by the large number of abortive cases, and especially the large number of cases in which reduction of temperature and general amelioration of symptoms were noted after the first inoculation. The mortality of cases treated in this manner before the eleventh day varied from 5 to 8 per cent. In those treated before the ninth day the death-rate fell to 4.7 per cent., and when an improved vaccine was employed the death-rate of those inoculated before the eleventh day fell to 3 per cent.

Inspector-General Cavallerleone referred to the practice of inoculation in troops sent to Tripoli. The serum used was that of Kolle-Pfeiffer combined with that of Professor Vincent. Local reaction was slight. The morbidity amongst the vaccinated was greatly reduced, and there were no fatal cases.

Generale-Medico Calcagno stated that antityphoid inoculation was begun in the Italian navy in July, 1912, owing to the outbreak of a severe epidemic amongst the troops at Tobruk. Two kinds were used—namely, that prepared at the Institute of Serotherapy at Milan, and that prepared at the similar establishment at Sienna. The former produced a severe reaction, and in consequence the men were reluctant to submit themselves to the second and third injections, and the Siennese vaccine was substituted. So far none of the inoculated had suffered from the disease, but the period was too short to warrant any definite conclusion.

Dr. Reynès described a vaccine made by Drs. Ranque and Senèz used at Marseilles. Sterilization was effected by iodine solution, this agent being subsequently neutralized by sodium hyposulphite. Amongst the workmen inoculated there had been no case of typhoid fever, although previously the death-rate from this cause had been high. Reaction was slight, and appeared only in 3 per cent. of the cases. The operation had been performed on a number of pregnant women, without untoward results.

Dr. Broughton Alcock discussed the use of a sensitized vaccine containing 1 million living bacilli per c.cm. In 25 cases two doses of 1 and 2 c.cm. had been given; two only complained of headache and malaise for two days subsequent to the injection. With doses of 1 and 3 c.cm. (12 cases) 4 suffered from the above symptoms. Larger doses were also used in certain cases. The cases were kept under observation for eight months, and the conclusion was arrived at that with doses of 1 and 2 c.cm. there was no danger to the patient, and little reaction except in peculiarly susceptible individuals. The interval between doses was from seven to ten days; with strong doses the patient should rest for twenty-four hours after the operation. The speaker quoted a case of pulmonary abscess secondary to typhoid infection, in which vaccine-therapy had given good results.

Professor Netter said that the therapeutic use of the vaccine resulted in decreased mortality and curtailed the duration and diminished the gravity of the symptoms. He thought that it might also be applied to the treatment of "carriers."

CAISSON DISEASE.

At the discussion on this subject, with special reference to divers in the navy, Surgeon-General W. May, C.B., Medical Director-General, R.N., was in the chair, Staff Surgeon R. W. G. Stewart, R.N., who introduced th subject, gave an account of the proceedings of the Admiralty Committee appointed to investigate the causes of the accidents which happened to divers. Experiments on animals, coupled with chemical examination of the air in the divers' helmets, revealed the fact that the distress suffered by divers, especially at great depths, was due to an excess of carbonic acid gas. It was further

shown that men could work at considerably greater depths than had been believed to be possible, provided the volume of air supplied to the diver were maintained at not less than 1.5 cubic feet a minute. Previously sufficient allowance had not been made for the compression of the air due to the pressure at great depths. A table was drawn up showing the limit of time during which a diver could remain at various depths, and also the safe rate of ascent, which varied according to the depth at which the man had been working and the time spent there. The only treatment of caisson disease was also shown to be recompression with gradual decompression, either by sending the man down again immediately or by means of a compression chamber. The selection of men was important. Only men of spare build and temperate habits, who were in perfect health, should be permitted to act as divers. A very careful training also was necessary to ensure that the man thoroughly understood the use of the valve and what to do in the event of an accident. Staff Surgeon Stewart quoted a number of cases to illustrate the accidents which might occur and their most effective treatment.

Independent Papers.

Yellow Fever and the Panama Canal.

Dr. J. J. van Loghem, Director of the Institute of Tropical Hygiene, Amsterdam, read a paper on the yellow fever danger for Asia and Australia, especially after the opening of the Panama Canal. He pointed out that *Stegomyia callopus* occurred commonly in the Dutch East Indies and neighbouring islands and that the larvae of this mosquito could breed in the water tanks of ships, hence there was a grave risk of *Stegomyia* infected with yellow fever being introduced from Central America to Asia and Australia, and that should this happen the local conditions were favourable to the occurrence of severe epidemics. He therefore strongly advocated the establishment of disinfecting stations under international control, at which all ships coming from a port where yellow fever was prevalent, should be thoroughly disinfected before being allowed to enter any harbour in tropical Asia or Australia.

Sir Patrick Manson said that in his opinion yellow fever would undoubtedly spread to Asia and Australia after the opening of the Panama Canal, unless stringent preventive measures were adopted.

A resolution proposed by Dr. J. J. van Loghem calling for international action on this subject was, after much discussion, rejected by the meeting.

Formaldehyde Vacuum Disinfection.

Stabsarzt Dr. Georg Mayer read a paper, illustrated by lantern slides, on a formaldehyde vacuum apparatus designed to carry out disinfection rapidly at low temperatures. The chamber was first warmed to 45° C. by steam, and the pressure in the interior was then lowered by means of an electrically-driven air pump to 0.2 of an atmosphere. Current steam was then admitted, and in its passage aspirated formaldehyde gas, vaporized from a 4 litre flask containing formalin solution; the pressure and temperature were kept constant. Spores were killed in fifteen minutes without damage to clothing or equipment. One of these installations had been set up in Servia at Pirot, and could disinfect the clothing and equipment of 6,000 men in twenty-four hours.

Epidemics due to Food Poisoning.

In another paper Dr. Mayer, working on the basis of official health reports from all countries in Western Europe, summarized outbreaks of food poisoning under three heads: (*a*) chemical poisoning, (*b*) bacterial and toxin poisoning, (*c*) trichinosis. The first class was nowadays rare. The second class was the most important, and though occasionally due to the consumption of diseased meat taken from animals which had been slaughtered in anticipation of death, were more often the result of contamination by extraneous bacteria between the time of slaughtering and consumption. Thus in Saxony, where raw meat was largely consumed, the incidence of food poisoning was higher than in any other part of Germany. The organisms most frequently implicated were *B. paratyphosus* B, *B. enteritidis* (Gaertner), and *B. proteus vulgaris*. He found in examining sausage skins prior to their being filled, as much as 16 grams of faecal matter in 1 metre. The temperature reached in cooking rarely exceeded 80° C. The bacterial content of sausage meat was in some cases as high as 16 million per gram.

Colonel Beveridge took exception to the general use of the expression "ptomaine poisoning." Almost all the cases in this country were due to poisoning by bacteria or their toxins, *B. enteritidis* being the chief offender. *B. paratyphosus* B was rare. As regards the temperature reached in cooking sausages, it frequently was much below 80° C., and in some cases not much above 50° C.

The Physiology of Physical Training and Marching.

Captain G. A. D. Harvey, R.A.M.C., read a valuable and instructive paper embracing the results of a number of careful observations carried out for the purpose of investigating the physiology of marching, and for determining the principles which should be observed by troops on the march. He pointed out that modern transport facilities had greatly reduced the amount of walking, and in consequence it had been necessary to adopt a special course of training in marching, for if troops could not march they were useless, as a commanding officer could not rely on having his men in the desired position at the appointed time. The human body resembled an internal combustion engine in that when working it produced heat. To a certain extent this was beneficial, and had long been recognized by trainers and others as "warming up to one's work." As the result of many observations it had been found that prolonged physical exercise caused a rise of body temperature. Any marked rise beyond 2.2° F. caused distress and lowered the efficiency of the body. A temperature of 103° F. was serious, and if maintained for any length of time gave rise to a condition resembling that of heat-stroke. The regulation of the body temperature depended on the production and dissipation of heat. The production of heat was increased by several factors, of which the principal were the load carried, the rate of marching, and any physical discomfort. The dissipation of heat was mainly effected by evaporation of water from the body. This again was largely influenced by the texture of the clothing, and by the manner in which it was worn. Thus, if the coat were kept open evaporation was facilitated. Humidity of the atmosphere also prevented efficient evaporation, and demanded special supervision of the men to detect any signs of distress. In order to permit of evaporation a sufficient quantity of water must be supplied to the men. This want was recognized, and arrangements were made to deal with it in the German army when troops were marching. Training was of the highest importance. Well-trained men could carry their loads and perform long marches without suffering distress, whereas a body of untrained troops would be totally unable to do so.

Major Jarvis (United States Army) said that the value of training in marching lay in the fact that marching became an automatic movement which did not call for the expenditure of any voluntary effort on the part of the central nervous system. Untrained men, if called on to do a forced march, were very liable to suffer from acute dilatation of the heart; this had happened in some of the National Guard regiments in America, and he thought that British Territorials would be similarly affected.

Colonel Jones, C.B. (Director-General of the Canadian Militia Medical Service), thought that the physical training of civilian youths ought to be considered. Nowadays no one walked, and in the event of having to mobilize the Territorials it would be found that the bulk of them were quite unable to march until they had had some time for training. He also drew attention to the fact that good marching depended on having a good disciplinarian in command who would enforce the observation of the various points which experience had shown to be essential.

Surgeon-General W. May, C.B. (Medical Director-General, R.N.), gave his experiences when marching across the desert to the relief of Gordon at Khartoum. He disagreed as to the necessity of having a plentiful supply of drinking water, as during that march of 200 miles under the most unfavourable conditions, the daily supply was only three tumblerfuls a head, yet no harm ensued.

TROPICAL MEDICINE AND HYGIENE.

DISCUSSION ON BERI-BERI.

PROFESSOR C. EIJKMAN (Utrecht), in introducing the discussion on the etiology and prophylaxis of beri-beri, said that the cause seemed to be either dietary or infectious. No specific agent had been proved, whereas it had been shown to be possible to give animals beri-beri by diet alone. Professor Eijkman said that in 1888 he had produced polyneuritis in children by feeding them on white rice, whereas unhusked rice not only did not cause the disease, but actually cured the condition induced by feeding on white rice. Meat in large quantities given to animals cured the condition as well as whole rice; on the other hand, by adding 50 per cent. by weight of fresh meat to the starchy food emaciation could be prevented, and yet the disease would appear, showing that it was not a question of want of albumen or salt. The poison theory of beri-beri Eijkman dealt with in his earlier experiments, only to deny it later. He was in harmony with the findings of Fraser and Stanton concerning the chemico-physiological action of the subpericarpal materials of the husk of rice.

Professor Dr. B. Nocht (Hamburg) agreed with Eijkman in his conclusions, but thought also that there was some truth at least in Schaumann's theory of the lack of phosphorus in the food of persons suffering from beri-beri. Though this represented only one of the elements wanting, yet for the present it must be assumed that phosphorus was the standard by which the possibility of prophylaxis and the question of a systematic diet must be judged.

Dr. L. Braddon (Malay States) gave a convincing demonstration of the value of unhusked or whole rice as a preventive of beri-beri and as a means of curing the disease in persons who had contracted it from eating polished rice. In gaols, hospitals, asylums, plantations, and wherever men were aggregated so that tests could be applied, Braddon demonstrated by statistical tables, the import of which was most telling, that beri-beri could be induced, arrested, or cured in direct accordance with the nature of the rice supplied.

Dr. S. Shibayama said that no definite conclusion concerning the cause of beri-beri had been reached in Japan; it was not thought that rice was the cause, but that everything pointed to an intoxication by a poison produced by a micro-organism possibly in the intestine.

The following took part in the discussion: Dr. Funk (Lister Institute), Dr. Schaumann (Hamburg), Dr. Nattan-Larrier (Paris), Dr. Rho (Italy), Dr. Malcolm Watson (Malay States), Dr. Tschudnowsky (Paris), Dr. Fink (Burma), Dr. Crissiuma (Brazil), Dr. Agramonte (Cuba), Dr. Sambon (London), Professor Martin (London), Mr. J. Cantlie (London).

DISCUSSION ON LEISHMANIASIS.

Professor A. Laveran (Paris), Dr. C. Nicolle (Tunis), and Professor Nattan-Larrier (Paris) dealt with the presence of leishmaniasis in countries bordering on the Mediterranean—Tunis, Algiers, Italy, Greece, and Egypt—and in Russia. The disease chiefly affected children in these countries, but although at first considered not to be identical in origin with the form met with in India, the more modern opinion was that they were one and the same disease.

A full discussion followed. Dr. Crissiuma mentioned the presence of the disease in Brazil. Dr. Gonder (Frankfurt) gave a lantern slide demonstration of the different strains of Leishmania parasites. Sir William Leishman drew attention to the three forms of the disease —the India type (kala-azar) which attacks adults for the most part, the Mediterranean type affecting children, and the dermal appearing as Oriental sore under various names, and referred to the possible presence of the disease in the Soudan, West Africa, and Nigeria. Dr. Row (Bombay) showed specimens of Leishmania in the post-flagellate stage. Professor Ayres Kopke (Lisbon) showed lantern specimens of Oriental sores in man. Dr. Splendore (Brazil) stated that in Brazil Leishmania-like bodies occurred on sores along with tubercle bacilli. Dr. Rho referred to the disease in Italy. Dr. Phillips (Egypt) stated that although Oriental sore occurred in Egypt the constitutional form of the disease had not been found in that country. Sir Patrick Manson suggested the advisability of attempting to obtain a vaccine from Oriental sore which might prove efficacious in the constitutional form (kala-azar).

INDEPENDENT PAPERS.

Dr. Evers read a paper advocating the use of chinosol in dysentery, given either by the mouth or intravenously.

Colonel P. Hehir, I.M.S., drew attention to a condition of ulcerated and swollen gums in Indian troops, which he ascribed to a defective dietary; catarrhal dysentery was usually present amongst men showing tender gums, and the symptoms seemed to indicate a scorbutic condition.

Dr. Charles E. S. Stewart (U.S.A.), in a paper on the probable identity of pellagra and sprue, maintained that there was a close resemblance between pellagra cases without skin eruption and sprue. His argument was based chiefly upon the alimentary manifestations by the true conditions.

Dr. Duncan White (China) drew attention to an undescribed form of ulcer met with in the tropics. It occurred in old men, chiefly in the leg; in 11 cases he had found that it could be cured by hydrogen peroxide.

Professor J. W. W. Stephens (Liverpool) gave a paper, with lantern demonstrations, on blackwater fever. He showed the relationship of malaria to blackwater fever, stating that in 64 per cent. of 75 cases observed parasites were present before the onset of haemoglobinuria; in 50 per cent. one day before the onset; in 33.3 per cent. on the day of onset; and in 19 per cent. one to fourteen days after blackwater fever subsided. Second attacks of blackwater fever occurred in about 10 per cent. of the cases, and the majority took place within twelve months of the original attack.

Dr. Masie (Jerusalem) referred to the presence of blackwater fever in Syria.

Dr. Fink (Burma) said he believed that blackwater fever was scarcely known in children.

Dr. Massey stated that Koch at one time did not believe that quinine-taking caused haemoglobinuria, yet he (Massey) induced a second attack in himself by a large dose of quinine. He believed there were two kinds of haemoglobinuria—namely, that induced by a specific organism and that induced by quinine.

Dr. S. T. Darling (Panama) remarked that at Panama blackwater fever occurred amongst labourers from Barbados (where malaria did not exist) after they contracted the disease in Panama.

Dr. Sambon remarked upon the seasonal variation of malaria and upon the geographical distribution of blackwater fever. Thus in the Roman Campagna blackwater fever was rare although malaria was rife, yet in Sicily and Sardinia blackwater fever was common.

Dr. Wasielewski (Heidelberg) gave a lantern demonstration of halteritidium in birds. He maintained that there were at least eight distinct varieties of haematozoa included in this group of bird parasites.

RADIOLOGY.

RADIO-THERAPY IN CANCER.

THE discussion on the use of radium and x rays in the treatment of malignant disease was opened on Saturday by Dr. Robert Abbe, senior surgeon to St. Luke's Hospital, New York, and Dr. Robert Kienböck, of Vienna. The Austrian surgeon made a retrospective survey and critique of the whole subject, while Dr. Abbe contented himself with a description of his own methods and results in radium treatment during the last ten years. Both communications were valuable, the one as a general review, and the other as a personal experience.

Dr. Abbe, who illustrated his cases by means of coloured plaster casts, a method of record which he preferred to the less vivid one of photography, said that surgery had expended its utmost powers and ingenuity in cutting out every vestige of disease, but while knife and cautery occasionally saved the patient, they never cured the disease; they only removed it. He looked for the cure to such forces as organic chemistry or bio-chemistry, or to agents like x rays and radium. He went on to describe the experiments on seeds and bulbs which he had brought before the Electro-therapeutical Section of the British Medical Association recently. After the suitable exposure of seeds to varying amounts of incessant radiation, he found a threefold influence: first, a death-dealing force which played upon the seeds in closest

proximity to the radium; secondly, a stimulating effect upon seeds situated at some slight distance; thirdly, a depressing and retarding effect upon seeds situated at a still further distance—several inches from the radium—within the range of only the ultrapenetrating gamma rays. This undiluted gamma radiation was of immense importance to surgery. It was responsible for bringing about a retrograde change and depression in those cells which had shown erratic overgrowth and had formed life-destroying tumours. For the last ten years he had studied the efficacy of radium upon more than 750 individuals, and the phenomena noted in the seed experiments had been repeated—that is to say, there had been destruction of tissues too closely in contact; stimulation of pathological cells in tissues somewhat further removed, and also, given the proper dosage, efficient retrograde degeneration of malignant growth with lasting benefits, amounting at times to surgical cure. He went on to cite the effect of radium upon common warts, vocal cord papillomata, and epithelioma of the skin. Ulcerating types of cancer were more responsive than some others to the use of radium, but where the mass of disease was too great it was not possible to penetrate effectually, and it became the duty of the surgeon to reduce the diseased tissue to a minimum—a thin shell as it were—before applying the radium. Many types of mammary cancer which were near the surface and involved the skin could be radiumized without operation, while others must be incised and tubes of radium buried in the tumour. Nevertheless, he added, in justice to the victim of malignant disease, one must still advocate early and complete surgical removal where possible. Dr. Abbe hesitated to speak of actual progress in controlling cancer of the tongue and oesophagus. In most cases of advanced disease there was a prompt and marked amelioration after the judicious use of large doses of radium, but the disease gained headway ultimately. One exception which he claimed was an excision of epithelioma at the frenum of the tongue, which after radium application remained well for five years. In obstructive rectal cancer a greater and unquestionably favourable effect was seen, but the condition required large quantities of radium filtered through 2 mm. of lead, and applied for eight or twelve hours daily for several days. There were as yet no recorded cures. In the field of uterine cancer there was more hope, and it was certain that the immediate effect of extreme radiumization on cancer developed in the uterine cervix or in the scar after operation was to modify profoundly the condition and give a sound cicatrix. The specific action of radium as a curative agent was illustrated in a remarkable way in the destructive type of sarcoma, and especially in giant-cell sarcoma of bone. Finally, Dr. Abbe put forward the new idea of "distance filtration." The radium was to be so placed that the tissues were only within range of the gamma rays. The pure gamma radiation, with its depressing action on pathological cells, could be obtained by filtering through lead, but distance filtration through air—a distance of 1½ in. seemed in practice sufficient to exclude most of the injurious rays and to give free and instant play to the entire gamma range—had the advantage that it did not involve the delay incident to passage through lead.

Dr. Kienböck, in his more general survey of the subject, pointed out that the ideal method in the treatment of tumours must be one by which the dissipation of the pathological cells could be secured without injury to the contiguous healthy tissues. Such an ideal was realized in *x* rays and radium, thanks to their selective action, or, to put it another way, the greater sensitiveness of the pathological cells to their influence. These agents had a remarkable action upon sarcomas, and when a sarcoma disappeared rapidly by means of *x* rays a recurrence scarcely ever took place. He mentioned a case occurring within his own experience in which an inoperable sarcoma of the kidney had yielded to the insertion of radium tubes in the growth. If in carcinomas the results were less favourable, other methods were equally disappointing, and he quoted a statement to the effect that 75 per cent. of the operated cases of carcinoma showed relapses. Like his fellow reporter, Dr. Kienböck also touched on the possibility of a stimulation of the growth as a result of the radiation. But, he thought, given proper technique, that the percentage of cases of malignant tumours unfavourably influenced by the rays was small. When they did occur they were due, not so much to the stimulation of the tumour cells by the rays, as to the acute inflammatory infiltration of the tissues set up in the neighbourhood of the tumour. This inflamed base was excited to a still severer inflammation by the rays, and consequently became less resistant to the further growth of the tumour. Dr. Kienböck protested against the idea that small *x*-ray doses were in any important respect stimulation doses.

Dr. N. S. Finzi, in his contribution to the discussion, chiefly devoted himself to considering the differences between filtered and unfiltered rays. He believed that the filtering of *x* rays increased their power to deal with diseased cells, whether these were superficial or deep. An instance came to hand in certain skin diseases, such as lupus erythematosus. When this was treated by unfiltered rays the results were not satisfactory, but with rays filtered through 1 mm. of aluminium they were extremely good. Nevertheless this was an absolutely superficial disease which only extended a few millimetres into the skin, and it was not a question of the rays being absorbed by superficial layers. By filtration of radium the alpha rays were certainly cut out, and with a comparatively thin filter the beta rays were also excluded, and even when the gamma rays alone were concerned a difference in the thickness of the filter produced a difference in therapeutic effect. The higher the penetrability of the issuing ray the greater the selective action on the growth. As to the comparative value of radium and *x* rays, in his own experience, if the disease were sufficiently limited, whether it was operable or inoperable, he always used radium, but in extensive cases like, usually, carcinoma of the breast he preferred to treat the whole area with filtered *x* rays.

Mr. C. R. C. Lyster also entered into the merits of less and more penetrating radiation, and other speakers were Dr. J. R. Riddell of Glasgow and Dr. Béclere of Paris, while a lantern slide demonstration, showing the results with radium in some cases treated in an Australian practice, was given by Dr. Clendinnen, of Melbourne, who accounted for the action of the radium on the hypothesis that it induced increased leucocytosis locally.

In summing up the discussion, Sir James Mackenzie Davidson expressed the view that Dr. Abbe, with his distance filtration, had not succeeded in getting a pure gamma ray. In order to obtain the gamma sheaf alone it was necessary to have a filter of 1 cm. of lead—a procedure possible enough in physical experiments, but clinically out of the question. Unless this filter were used there would be an admixture of beta radiation. As to the injurious potentiality of the rays, he had good reason to be aware of it, though it seemed likely that these tragic instances were the result of errors in dosage, and that a more instructed technique would eliminate them in practice. Undoubtedly radium might have a stimulating action upon pathological cells as well as, under different conditions, a depressing one, but this contrariness of effect was a peculiarity which it shared with alcohol and with every drug. Dr. Abbe, in his reply, mentioned that he had dropped the use of *x* rays in connexion with general surgery. He considered that the essential thing for the radio-therapeutist to-day was to discover the range of the stimulating element in the rays he used.

Radiotherapy of Enlarged Prostate.

At the afternoon meeting in the Section of Radiology on Monday, Dr. Haret (Paris) described his method of treating hypertrophy of the prostate by *x* rays, while Dr. Paul Degrais (of the same city) described a similar application of radium. Using small doses, generally at weekly sittings, and filtering through ½ mm. of aluminium, Dr. Haret had observed a diminution of diurnal and nocturnal frequency, and locally a diminution of the prostate. The simple irradiation by the perineum was sufficient. All forms save the glandular hypertrophies, however, should be left to the surgeon. Dr. Ledoux-Lebard thought there was something to be gained by the combined use of radium and *x* rays in the treatment of diseases of the prostate. He had recently treated two cases of enlarged prostate by introducing the mesothorium into the rectum, applying the *x* rays in two directions, suprapubic and perineal. Professor Bergonié also cited a case

in which radium had proved of value in inoperable cancer of the rectum, having been applied for twenty-four hours after some preliminary surgical procedure.

Communications on the radio-therapy of uterine fibroma were forthcoming from Drs. Jaugeas and Béclère, the former stating, on the basis of 31 observations, that the artificial menopause appeared after four or five sittings in patients over 40 years of age, and after seven or eight sittings in younger patients.

Value of *X* Rays in Prognosis.

At the final meeting of the Section of Radiology on Tuesday afternoon, an interesting communication was made by Dr. E. H. Skinner (Kansas City) suggesting a rather new mode of procedure with the *x*-ray negative. Dr. Skinner believed that the prognosis in fractures at the ankle and wrist could be mathematically calculated from the radiograph. His method could not be summarized in a few words, but his main idea was that in the anatomical reduction of fractures less attention need be paid to the fragments if the joint surfaces were in correct relation and the lines of weight-bearing force functionally satisfactory. Nature was wonderfully tolerant of fragments if she could maintain the functional joint surfaces. He showed how the lines of weight-bearing force might be charted on the negative, and the proper adaptation, for instance, of the astragalus to the tibia, which was the secret of the correction of ankle fracture, noted. If the antero-posterior *x*-ray negative showed the astragalus centred under the tibia, the prognosis as to functional result would be more favourable than with any anatomical alinement of fragments. With regard to the wrist, his axiom was that the entire styloid process of the lower end of the radius was constantly distal to a line which touched the tip of the ulnar styloid, which line was at a right angle to the longitudinal axis of the radius. The charting, again, of certain lines made it possible to say whether or not the fracture was properly reduced.

Another piece of information which the skiagram might afford, according to Mr. S. Gilbert Scott, of the London Hospital, was with regard to the malignancy or otherwise of bone disease. Certain changes could be observed radiographically, and it was quite possible in most instances to judge from the rate of growth as shown in the skiagram whether a case was a myeloid or a true endosteal sarcoma. The typical skiagram of a myeloid sarcoma showed the expansion of the bone and trabeculation, which latter was not the exaggeration of the normal bone trabeculae, but consisted of irregularly arranged ridges in the wall of the expanded portion, the thin bone lying in the hollows formed by these ridges. Mr. Scott also dealt with the radiographic indications of endosteal and periosteal sarcoma and the worm-eaten appearance of the bone in secondary carcinoma.

Urinary Calculi.

Dr. Desmoulins, Director of the Radiological and Electro-Therapeutical Laboratories of the Department of the Seine, read a paper on the *x*-ray examination for urinary calculus. If the employment of rays of smaller penetration, together with intensifying screens, was required for the detection of the shadow of the kidney, he had observed, on the contrary, that in the case of large calculi it was necessary to employ a harder ray. With the softer rays the renal shadow was good, but the image of the calculus was indecisive. He admitted that it might happen, though rarely, that the most careful radiological examination allowed a calculus to pass unperceived, even in a thin subject.

Tuberculous Peritonitis.

The final paper was read by a Bulgarian medical man, Dr. Balsamoff, of Sofia, who gave an account of 11 cases of tuberculous peritonitis treated by *x* rays, and 1 case of tuberculosis of the liver similarly treated. Out of the 11 cases he claimed to have obtained 8 cures and 2 ameliorations.

HISTORY OF MEDICINE.

In the last days of a congress it is generally to be noticed that, although the interest is maintained, the attendance falls off. This was so with the History of Medicine Section of the International Medical Congress. The attendance, which on one day exceeded 80, fell on the last day to 20.

On the third day (August 11th) the first paper read was one by Dr. J. C. McVail (Edinburgh), tracing the history of small-pox to the ancient records of the Chinese and Hindustani before the Christian era, and the practice of inoculation to Brahmin observances of the same period. Then followed Dr. W. H. Hamer (London) with an important history of epidemiological research during the last seventy years, and Dr. Wickensheimer (Paris) with an interesting account of medico-astrological systems of the ninth, tenth, and eleventh centuries, and Dr. J. H. Bell with an instructive account of Bernard de Gordon's *De Conservatione Vitae Humanae*. A paper which elicited the keen interest of the home members was that by Dr. J. B. Nias (London) on the outbreak of typhoid fever among the Royalist troops during the siege of Oxford—an outbreak due to the same small streams being used for both cleansing and culinary purposes. Dr. Lewis Jones (London) traced the history of electro-therapeutics from the invention of the Leyden jar to the introduction of the high-frequency current. Professor Fraser Harris returned to the old controversy whether the merit of discovering the circulation of the blood belonged to Harvey or to Cesalpinus, bringing forward new evidence in favour of the English claimant. This brought the President of the Section, Dr. Norman Moore, to his feet with a warm eulogium of Harvey, which elicited the hearty approval of all present. Dr. Hovorka (Austria) followed with an account of the votive offerings of the ancient Greeks—an interesting paper, in the discussion upon which Dr. Parkes Weber (London) and Professor Sudhoff (Leipzig) took part. Then followed Mr. S. M. Mitra, who gave an account of ancient Hindu medicine, and claimed for his fellow countrymen that they understood the circulation of the blood 4,000 years ago, though he did not claim for them that they understood at that period the structure and mechanism of the heart. Dr. E. C. Streeter (Boston, U.S.A.) read a paper in which he made certain corrections in the dates given in La Cumarcino's *De Morbo Gallico*. The last paper for the day was a very interesting account by Mr. Laurie Lawrence (London) of the little known Thomas of Wesham, surgeon to Henry III, who possessed the privilege of minting coins of the realm.

On the fourth and last day (August 12th) Sir Francis Darwin led off with a brilliant paper on the historical relations of medicine and botany, in which, after reference to the work of his distinguished father, he pointed out that although the old dependence of the physician upon the herb-gatherer had ceased, medicine had still much to learn from botany with regard to cell life. Dr. Milne (London) gave an interesting account of Galen's knowledge of muscular anatomy, which he pointed out was singularly accurate considering that Galen never dissected the human body. Dr. J. A. Nixon (Bristol) next described the interesting MS. of Guy de Chauliac, which had been presented by a former Archbishop of York to the Corporation of Bristol, and was still treasured by that body. Dr. Parkes Weber (London) described, and showed with the epidiascope, coins and medals having relation to the healing art, and Mr. Thompson described "Terra Stigillata," an antiseptic earth found in the island of Lemnos, which when made into little discs or seals was taken internally for a variety of ailments. Mr. Alban Doran followed with the subject he has so thoroughly made his own, the obstetric forceps used during the eighteenth century, and exhibited the collection in the possession of the Royal College of Surgeons. Mr. Nelson Hardy (London) read a paper upon epidemic mental disorders. The final paper of the Section and of the session was by Dr. Raymond Crawfurd, who, returning to a subject he had dealt with in his Bradshaw Lecture, the great plague of Athens, confessed himself, after further study, unable to determine whether that epidemic was one of bubonic plague or of typhus fever.

Proposed International Society of Medical History.

Before the sitting closed Dr. Capparoni (Rome) presented a suggestion he had brought from the Italian Medical Society that a permanent international society for the study of medical history should be formed. Upon the proposition of the President it was decided to refer this suggestion to an international committee composed as follows: President, Sir William Osler (England); other members: Professor Sudhoff (Germany), Dr. Wickersheimer

(France), Dr. Streeter (United States), Dr. Djurberg (Sweden), Dr. Johnsson (Denmark), Mr. Wellcome, and, as honorary secretary, Dr. Capparoni (Italy).

CLOSING SPEECH OF PRESIDENT.

The session was brought to a close by a speech by the President, who referred to the great importance of the papers read, and the great interest those papers had elicited, and expressed his belief that no future International Congress would be without its History of Medicine Section.

VOTE OF THANKS TO PRESIDENT.

A cordial vote of thanks for the ability and the courtesy Dr. Moore had shown in presidential office was then proposed by Professor Sudhoff, seconded by Dr. Capparoni, and carried by acclamation.

THE INTERNATIONAL CONFERENCE ON POST-GRADUATE MEDICAL INSTRUCTION.

The International Conference on Post-Graduate Medical Instruction was held in the Jehangir Hall of the University of London, on Thursday, August 7th. This Conference was promoted by the International Committee for Post-Graduate Medical Education—a society founded in 1910 on the initiative of Germany and now numbering among its members representatives from most of the European countries and from the United States of America. The International Committee, which has as its President Professor Waldeyer (Berlin), and on its board of management Professor von Grósz (Budapest), Professor Kutner (Berlin), Professor Landouzy (Paris), Sir Donald MacAlister, K.C.B. (Glasgow), and Professor von Rein (St. Petersburg), holds periodical conferences, generally in conjunction with the International Congress of Medicine. At these conferences questions of general interest concerning medical education and post-graduate instruction are discussed.

On the present occasion the subjects for discussion were as follows:

1. The present regular course of university education up to graduation (including the examinations) and the legal provisions governing the whole course.
2. The relationship between the university curriculum and the courses of instruction for post-graduates, and the present state of medical post-graduate instruction.
3. On the necessity of some reform in the courses of instruction in view of the importance of technical skill in the medical profession.
4. The importance of State medicine and its allied branches as a subject for instruction before and after qualification.

Reports on the first two subjects were submitted by various representatives and delegates from America, Germany, England, the Netherlands, Sweden, Switzerland, and Hungary, as contributions to the collective investigation being made by the Committee.

THE REGULAR UNIVERSITY COURSE FOR GRADUATION.

Sir HENRY MORRIS read a paper on the first subject, in which the whole curriculum requisite to obtain a qualification in the United Kingdom was reviewed. He drew attention to the fact that in Great Britain and Ireland the qualification to practise medicine and surgery might be either a university degree or a diploma of one or more of the medical corporations in England, Scotland, and Ireland, and that the medical curriculum had to be carried out in a recognized medical school, which might or might not be attached to a university. The standard of general education required by the various examining bodies was not the same, and reasons were given why it was desirable to raise the lower standards. The several kinds of institutions other than universities or medical schools at which the preliminary sciences—biology, chemistry, and physics—might be taught, were enumerated, and it was pointed out that an examination had to be passed in these subjects before the commencement of the study of the intermediate subjects. The whole curriculum lasted five years, and in the study of the higher medical subjects (clinical medicine and surgery) great importance was attached to the various methods of practical instruction and to the holding of clinical appointments. As soon as a qualifying degree or diploma had been obtained registration of the same at the office of the General Medical Council of Education and Registration in the United Kingdom was necessary. The constitution and the powers of the General Medical Council were then described, and it was pointed out that the influence of the Council on medical education was to standardize the minimum requirements and to raise and equalize the instruction given at the various medical schools as well as the various examinations. Sir Henry Morris concluded with some observations on the "one portal system," which he said should be made essential for registration to practise, but so as not to interfere with the existing university degrees or the higher qualifications of the Royal Colleges of Physicians and Surgeons, which, however, would not entitle their holders to practise without the possession of the "one portal" certificate.

Professor EMILE VON GRÓSZ of Budapest submitted a report on the teaching of medicine in Hungary—a report of much interest as exemplifying the Continental system. He began with a brief historical survey of the teaching of medicine in Hungary, which was placed on a sure foundation by the reorganization of the University of Nagyszombat by command of the King, Maria-Theresa, in 1769. This university was transferred to Buda in 1777 and to Pest in 1784, and placed in 1848 under the authority of the Minister of Public Instruction. Since 1867 the teaching of medicine had also been under the control of the Minister of Public Instruction. In 1874 a second university was founded at Kolozsvár, and last year Parliament had agreed to the establishment of two more universities, one at Pozsony (Pressburg), the other at Debreczen. Such had been the progress of university teaching in medicine that whereas in 1867 there were but 13 professorial chairs there were now 26, and, in addition, 120 privat-docents, of whom 20 bore the title of "Professeurs extraordinaires." In the University of Budapest the grave difficulty had been in the teaching of practical work owing to the large number of students—nearly 3,000.

The whole medical curriculum lasted six years for the diploma of Doctor. The preliminary studies in zoology, botany, and mineralogy were not made the subject of examination, and in consequence the study of them was purely nominal. Amongst the courses of lectures and demonstrations those given at the Institute of Legal Medicine were particularly mentioned. The material for teaching in this institute was abundant, more than 1,400 bodies being examined in a year, and, in addition, some 200 cases were subjected to examination during life. Clinical medicine and surgery were fully taught. After the fourth session (end of second year) students had to present themselves for the primary examination or first "rigorosum" in chemistry, physics, anatomy, and physiology. After the tenth session came the second "rigorosum" in pathological anatomy, general pathology, pharmacology, therapeutics, hygiene and forensic medicine; and after this the third "rigorosum" in clinical subjects. The examinations were held by the professors with a jury presided over by the doyen of the faculty. At the third "rigorosum" a representative of the Government was present. These "rigorosa" were practically State examinations. After passing the third "rigorosum," in order to obtain the diploma of Doctor from the University, students had to spend one year either in a university clinic or in one of the public hospitals. The latter were 75 in number, with 21,000 beds, and they could give accommodation to 700 of these students.

POST-GRADUATE TEACHING.

Professor von Grósz stated that the teaching of post-graduates had since 1910 been controlled by a Central Committee convened by the Minister for Public Instruction. This Committee dealt with the whole subject of post-graduate instruction, and arranged all the lectures and courses to be given. The Committee received from the Minister of Public Education 30,000 crowns yearly for the expenses of post-graduate teaching, and 4,000 crowns from the Minister of the Interior. Besides this the departmental and municipal authorities allotted some 10,000 crowns yearly to the doctors who attended these courses. The Central Committee paid from 16,000 to 18,000 crowns per annum to the professors who gave the post-graduate courses, and about 10,000 crowns to the doctors who attended them. Some such central institute as the Kaiserin Friedrich-Haus (the head quarters of the International Committee) in Berlin would be desirable in Budapest.

Dr. HAWTHORNE drew attention to the spread of the post-graduate movement in this country, and paid a tribute to the influence and example of the late Sir Jonathan Hutchinson, who had done so much to originate and further post-graduate teaching. The conclusions Dr. Hawthorne had come to were: (1) That there was a steadily increasing desire on the part of practitioners for opportunities to acquire the most modern methods of diagnosis and treatment. (2) That the teaching for practitioners must be separate and distinct from that for students. (3) That clinical demonstrations and practical laboratory courses were particularly needed. (4) That to be successful post-graduate instruction must be provided in such a way as to minimize the expenditure of time and money on the part of the practitioner. In spite of the many schools and institutions for post-graduates and of all the courses of instruction in special and general hospitals in London and the provinces, it was notorious that London, as a centre of post-graduate instruction, could hardly boast more than a minimum of success. What was required was: (1) a central office or bureau where information on post-graduate teaching might be obtained; (2) co-operation and co-ordination between institutions giving similar classes of work and practice; (3) some organized scheme of instruction embracing all departments of professional work; and, lastly, (4) the active support and co-operation of the London teachers. Such requirements would best be met by the co-operation and co-ordination of existing schemes and the organic relation of these to a central bureau and to a general hospital. Some such organization was essential if London was to live up to the height of its opportunities. In order to provide full opportunities for post-graduate study for every practitioner in the British Isles, similar organizations must be developed in each of the important medical centres of the United Kingdom. Further, the opportunities for post-graduate instruction should not be monopolized by the medical schools. On the contrary, county and other provincial hospitals might take a due share, such an arrangement tending, perhaps, by stimulating the interest of the local practitioners, to keep the old cases in touch with the hospital, and so to the preservation of records which would otherwise be lost. If in individual instances nothing else in the shape of post-graduate teaching were available, it was suggested that the *post-mortem* examinations conducted in hospitals and Poor Law infirmaries should be open to members of the profession. Post-graduate instruction of this kind could not be carried out without expense, and as the ultimate benefit would be to the public, it was not unreasonable to expect that the latter should bear at least some part of the expense. This might be in the shape of either public or private endowment of certain general post-graduation educational institutions.

Professor KUTNER, the General Secretary of the International Committee, regarded the purpose of university education as being (1) to give the student a complete outline of the modern theoretical side of medicine in all its branches, and (2) to lay the foundation for the acquirement of that technical skill which could only be gained by practice. The purpose of post-graduate medical education was to keep the physician constantly informed in all the branches of theoretical and practical medicine by means of lectures and practical work in order to make him familiar with all new developments, and to keep him steadily on the highest level of professional attainment. In Berlin the Kaiserin Friedrich-Haus, under the directorship of Professor Kutner, was established by means of the "Kaiserin Friedrich Foundation for Post-Graduate Medical Education," founded for this purpose, its objects being to promote the whole system of such education, and at the same time be a memorial to her late Majesty the Empress Friedrich. The Haus was opened in March, 1900, and serves (1) as a central home for post-graduate medical education and its various organizations—namely, (*a*) the Federal Board for Post-Graduate Medical Education, (*b*) the Central Committee for Medical Post-Graduate Education in Prussia, (*c*) the International Committee for Post-Graduate Education; (2) as a centre of instruction for practitioners in all branches of work; (3) as a central department for lending, free of charge, charts, diagrams, microscopic slides, etc., for lecture purposes; (4) as a permanent exhibition of all forms of medical appliances, instruments, etc.; (5) as a place for special exhibitions for medical instruction; (6) as a medical information bureau which gives gratis information respecting post-graduate education throughout the German Empire; (7) as a literary centre for all matters concerning post-graduate education (journal, *Zeitsch. f. aerztliche Fortbildung*).

The Haus was built by voluntary contributions, and the cost of maintenance, etc., is 50,000 marks per annum. This sum is paid partly in rent of rooms taken by the State Government, partly from rents paid by exhibitors in the permanent exhibition, and partly from interest on the foundation capital not used up in building.

Professor Kutner also prepared for the Conference the Report of the Federal Board for Post-Graduate Medical Education in Germany—a pamphlet of 179 printed pages giving full details of the whole of the general and special courses arranged by the Board throughout the German Empire. This report indicates very clearly the high organization of post-graduate studies in Germany.

PRACTICAL INSTRUCTION.

On the third subject for discussion—namely, the necessity for "some reform in the courses of instruction in view of the importance of technical skill, etc."—Professor KUTNER read a paper emphasizing the rapid growth of medical technique and the refinement of its methods, both of which demand a greater measure of attention than they receive at present in the course of the medical curriculum. Professor Kutner described in detail the subjects of instruction, which he considered should be essentially of a practical nature, these subjects covering a very wide range. He was of opinion that the final medical examinations should include practical tests in which the candidate's proficiency in the most important technical operations should be proved, and, further, that in medical post-graduate courses physicians should be given every opportunity of acquiring a manipulative skill by actual practice.

STATE MEDICINE.

On the fourth subject—namely, the importance of State Medicine and its allied branches—Professor LENNHOFF submitted a report on the subjects which should form the basis of instruction, and also on the question of the times at which such instruction should be given in the university course and in post-graduate courses.

MEETING OF PERMANENT COMMITTEE.

At the conclusion of the general meeting of the International Committee a meeting of the Board of Administration and of the permanent regular members of the Committee was held, Professor WALDEYER being in the chair.

Sir DONALD MACALISTER conveyed the good wishes of the Lord President of the Privy Council to the International Committee. He stated that the Privy Council, the War Office, the Admiralty, the India Office, and the Scottish Office had each agreed to appoint one of the five British members by whom the Government of this country was to be represented. The General Medical Council had also, at the instance of the Privy Council, interested itself in the work of the International Committee, and had through its officers obtained a large body of information for the collective investigation now in progress.

The report of the General Secretary, with reference to the applications for membership so far received from different countries, was submitted; resolutions with respect to further measures to be taken were considered; and the Treasurer's report received.

DR. FITZMAURICE MANNING AND DR. THOMAS HOOD, of the West African Medical Service, have been appointed medical officers for Northern and Southern Nigeria respectively.

THE number of medical students in the Universities of Austro-Hungary in the summer session just ended were as follows: Vienna, 2,369; Graz, 241; Innsbruck, 326; Prague (German), 549; Prague (Czech), 874; Lemberg, 574; and Cracow, 539.

THE late Mr. Alfred Willett left estate valued at £21,329.

DR. JOHN CREW, of Higham Ferrers, Northants, formerly president of the South Midland Branch of the British Medical Association, who died on June 16th, left estate of the gross value of £47,647, of which £44,017 is net personalty.

EXPERIMENTS ON DOGS.

THE Dogs (Protection) Bill has received its quietus, at least for the time. The matter has given rise to a controversy in the *Times* initiated by Mr. John Galsworthy. He takes the purely sentimental ground that the "dog is by far the nearest thing to man on the face of the earth"; therefore he "deserves loyal treatment." We may remind Mr. Galsworthy that there is a creature nearer to man even than the dog, and that is man, a fact often lost sight of by those who carry their love of the dog into a cult not much this side of idolatry. We yield to none in our appreciation of the fine qualities displayed by many dogs, but we recognize that even the most friendly and valuable dog is a little lower than a human being. The sentiment of the lady quoted by Mr. Galsworthy, that if she were condemned to spend twenty-four hours alone with a single creature she would choose to spend them with her dog, may be compared with that of the women who bedizen their dogs in what Lear might have called Persian attire and send them out walking under the care of stalwart footmen, and erect monuments to the pious memory of their pets, when they die, in prettily laid-out cemeteries. Such persons often treat their human dependants with scant consideration and sometimes—and here we speak of that which we do know—with positive cruelty. What Mr. Galsworthy means by the "loyal treatment" of dogs we do not quite understand. We owe them kind treatment on the ground of humanity, but surely he will not contend that we are under any obligation of fealty to them. The assumption that animals have rights is founded on a confusion of thought. If they had rights they would have correlative duties for neglect of which they would be liable to punishment. Surely it is not proposed to revive the farce of trying and executing animals for stealing and other offences, as was the custom in some countries in the Middle Ages. No reasonable cause was shown by the champions of the dog in Committee why he should be exempted from vivisection. The disingenuous cry of "torture" has again been raised. Need it be said once more that there is no torture when anaesthetics are used? The evidence given before the Royal Commission by Mr. F. Hobday of the Veterinary College is a conclusive proof of the falsity of the oft-repeated statement that dogs cannot be kept under anaesthesia. The whole subject of experiments on dogs was exhaustively dealt with in the Committee by Dr. Chapple in moving an amendment. As his speech has not been reported, and as one or two of his arguments have been misrepresented in certain quarters, we think it well to give here some of its most important passages. He said:

The vivisection of to-day is as different from that of Bell's time as is the surgery of to-day. Those who oppose this experimental research know nothing of this change, or blind themselves to it. Take an operation on a dog. He gets a hypodermic of morphine about half an hour before he is chloroformed. When he is sleepy and indifferent he is placed in his box, and a handful of cotton-wool, over which chloroform or chloroform and ether have been sprinkled, is dropped in beside him. He quietly passes from his sleeping or semi-sleeping state into that of anaesthesia. There is nothing dreadful about that. If the dog were to be dispatched, that is absolutely the most humane way in which it could be done. Then, if it is necessary that the dog should lie upon his back, he is fixed in that position by strings tied to his legs, not that he may be unable to move or struggle when under torture as the antis allege (for there is no torture, no pain, no consciousness), but because a dog will not lie on his back without rolling over on his side. When a man or a child is required in any other position than on the back for operation purposes, he must be fixed too. Then the operation is completed, and the observations made and recorded. A few extra drops of chloroform put the dog's life out. Where is the torture or pain, or even discomfort, here? There is none. If the dog must be kept alive, the effect of the morphine remains for twelve or twenty-four hours, and the after-pain is thus avoided, or an extra dose may be given. The pain after operations that belonged to the surgery and vivisection of sixty years ago was due to inflammation, suppuration, and other sequelae. Since the establishment of antiseptic treatment these are practically unknown. If by any chance they do occur, the dog is killed with chloroform. In the absence of these complications there is little or no pain after operations, and when it does, or is likely to occur, a small dose of morphine carries the patient or the animal over the post-operation period.

Now why dogs, and not other animals? If it were a matter of indifference we could quite easily yield to those whose misplaced sympathy has promoted this bill. But no other suitable animal is available. The dog is carnivorous like ourselves—he can be made omnivorous like ourselves, and therefore the study of his digestive organs gives us data upon which we can act in the study and treatment of the human subject. The circulation of the dog is similar, and the size of the heart and circulatory system makes it possible to experiment and observe. The number and price of mongrel-bred dogs make it possible to keep up the supply. Apes are not to be had; rabbits and mice are too small and dissimilar; sheep and goats and horses are too large and too costly.

The hon. member for Peterborough (Mr. George Greenwood) says that all this experimentation goes on for the sake of increasing the knowledge of scientific men. That is not the end. If it were I might be an antivivisectionist. The end is the alleviation and cure of pain in men and women and little children; of pain and suffering and disease in dogs themselves. The knowledge is merely a means to an end and not an end in itself.

Take dogs themselves. Hydrophobia has been exterminated in this country through the knowledge and practice that have come to us by experiments on dogs. (Mr. Auberon Herbert: It still exists in Constantinople.) They have not followed the advice which experiments have given. When the right hon. gentleman the member for the Strand (Mr. Walter Long) was in power he had two advisers: Pasteur, who told him the nature, cause, and means of prevention of hydrophobia, and the antivivisectionists, who told him that it was only "lunacy in dogs," and was not infectious. (Mr. George Greenwood: I never said that. We cannot be responsible for all that every one says.) I never thought so little of the hon. member's intelligence as to think that he did. Mr. Long followed the advice of Pasteur rather than that of the misguided "antis," and the dogs of Britain are to-day free from a loathsome and terrible disease, for which they have to thank the experiments of the past, for when all the facts are known experiments and vivisection cease. If no other result than this had followed upon the vivisection of dogs, these experiments would have been amply justified. I could mention the happy results on distemper and malignant jaundice, but I will hurry on to the results in man.

Experiments on eight dogs by Czerny showed that the larynx can be removed with safety. Cancer of this organ, therefore, can be cured by complete removal with little danger of recurrence. If the Emperor Frederick William had been suffering to-day he would have been indebted to dogs for his treatment and probable cure.

Valuable and promising experiments are now going on into the causation and cure of diabetes by Professor Starling. (Mr. Chancellor: He gets his living out of it.) That interjection is a fine example of the sordid and bigoted attitude of those who, in entire ignorance of the nature and aim of vivisection, can find no worthy motive in those who give their lives that suffering and disease in man and animals may be abolished, and who have constantly to defend themselves against malignancy and ignorance.

Professor Starling has shown that removal of the pancreas in dogs causes diabetes, a painless disease, but one, the cause and cure of which is not yet known. Here we have a ray of hope for thousands of children, women, and men in this country. How much would they give if you could tell them that the shadow of death from a fatal disease could be removed from their homes? Dogs who have thus got diabetes are being treated and fed in ways that suggest that the discovery of the true nature and cure of the disease are not far off. We must be able to diagnose a disease before we can cure it; we must know its cause before we can prevent it. If this bill passed in its present form it would tend to delay, if it would not frustrate, promising research along these lines.

Take, again, our knowledge of the diseases of the circulation. The hon. baronet in charge of this bill (Sir F.

Banbury) could not go into his doctor's consulting room with a gouty heart without being indebted for differential diagnosis and treatment to the dogs that have been submitted to experiment. If he sat with his hands and feet in salt water and let the electric currents of his heart express themselves on the cardiogram of a string-galvanometer such as this I hold in my hand he would have to thank dogs and their experimenters for the prospect of his cure.

I see the hon. member for Peterborough (Mr. Greenwood) handing round to members of the Committee photographs of dogs. I could hand him photographs showing idiots—stunted dwarfs, with scanty hair and parchment skin and dull eyes, and thick limbs, and slow, unresponsive movements, and also contrast photographs showing those same children after a few months of treatment, discovered by experiments on dogs, with such a complete change from the idiot to the sane and normal, that the facts would seem incredible. Would the hon. member take as much delight in such photographs as in those he hands round, or would he deny to the mother of an idiot the joy that this research work has brought to her heart?

We may also refer readers interested in the subject to the leaflet (Form C 28) addressed "To lovers of dogs," and issued by the Research Defence Society, 21, Ladbroke Square, London, W.

LITERARY NOTES.

The June number of *L'Hygiéne* is as usual admirably illustrated, and contains a number of interesting and instructive articles. Dr. "Horace Bianchon" writes on the new law of three years' military service from the hygienic point of view. Professor Marcel Labbe treats of food and sport. He says that while vegetarianism has a brilliant record of victories in running, climbing, cycling, and so forth, it is in accordance with physiology and experience that the fundamental ration of the sportsman must be a mixed diet, but with only a small proportion of meat. All athletes now recognize the danger of excessive feeding, and especially of the abuse of meat and alcohol. All seek in a light and sugared diet the supplement of energy necessary for the rapid restoration of their strength. Dr. Maurice de Fleury writes on the causes of neurasthenia. Speaking of the relations between neurasthenic and surgery, he cites Professor Pierre Delbet as saying: "The hysteric is a creator (of morbid manifestations), the neurasthenic a victim; the hysteric creates his symptomatology, the neurasthenic suffers it. The neurasthenic is a beaten man—beaten by fatigue, by emotions, by intoxications, by the stress of life, often also by visceral disturbances." Cases are cited in which a pancreatic cyst, a gastric or duodenal ulcer close to the pylorus, chronic appendicitis, diseases of the genito-urinary apparatus in man or woman have been accompanied by evident symptoms of neurasthenia that have wholly disappeared after operation. M. Francis Marre, chemical expert to the Paris Court of Appeal, deals fully with milk and cream; and Madame Augusta Moll-Weiss contributes a short article on the hygiene of the house in time of disease. She holds that flat roofs properly sheltered from wind should be used for hygienic purposes. She urges that such roofs should be provided for workmen's dwellings. There pure air could be breathed, and people could asepticize themselves by free exposure to the rays of the sun.

The *Aberdeen Weekly Journal* of July 25th contains a note by "J. M. B." on William Gordon, Professor of "Phisick," who is remembered by reason of the licence he got from the Privy Council in 1636 to dissect dead bodies for the instruction of his students. The following royal reference to him is quoted:

> 1632. April 5. Hearing that the office of Professor of Physick in the Vniversitie of Aberdene is voyd and at our gift, We, being informed of the sufficiencie of Mr. William Gordon, Doctour of Phisick, to discharge the place;
>
> Our pleasour is that yow informe yourselff of that Estate thereof, and if yow find that the right of presenting thervnto be unto Ws, that furth with you draw up a presentatioun to that effect in behalff of the said Mr. William that he may discharge the same and enjoy the priviledges belonging therunto, willing that the presentatioun pass immediatlie under our cachet and Prive Seall, without further warrant; ffor doing whairof these presentis shal be unto yow and other our officeris to whom it may concerne a sufficient warrant.—The Earl of Stirling's *Register of Royal Letters*, 585.

In Publication No. 7 issued by the Medical Faculty, Queen's University, Kingston, there is an interesting article by Professor Adami, of Montreal, giving an account of his teacher, Sir Michael Foster, and his influence. Foster was led to take up the study of medicine because, although he gained the first place in classics at the B.A. examination at the London University he could not, as he was a Nonconformist, proceed to Cambridge. Signs of pulmonary disease showing themselves not long after he had taken his doctor's degree, he went to sea for a time as ship surgeon, and afterwards returned to Huntingdon, his native place, to start in practice with his father. Country practice, however, did not appeal to him. Professor Adami says:

> A great reader, he would sit up late at night, and then, as once with a reminiscent smile he confessed to me, he could not get up in the morning, and that was bad for routine calls. The daily round did not appeal to him. When, therefore, six years later, his old teacher Sharpey invited him back to University College, to give a course in practical physiology, he accepted the invitation with alacrity, and gave up medical practice for ever.

Sharpey's teaching was far ahead of that of any of his British contemporaries. He was the first teacher in this country to devote his life to the subject, and he realized the need of practical instruction. In London, Foster also came under the influence of Huxley, who made him the biologist as Sharpey had made him the physiologist. It was at the suggestion of George Eliot and George Henry Lewes that in 1871 Foster was invited to become prelector in physiology at Trinity College, Cambridge. He determined to establish as great a biological and physiological school at Cambridge as was in his power. He was given only half a room, a large chamber being divided by a wooden partition into two, the other half being occupied by the Plumian Professor of Astronomy. The accommodation was too small. Foster, however, did not complain, but by a scientific manœuvre dislodged the astronomer.

> With a wise humour he suggested to one of his pupils a research into some of the rarer of the dissociation products of proteid metabolism; if I remember aright I think the substance was uro-erythrin. It was a research which, in order to obtain an adequate amount of material, demanded the boiling down over several days and weeks of many gallons of excrementitious fluid. The Plumian professor did not merely vacate the premises; he spread about so dire a report of the disadvantages of close proximity to the physiological laboratory that by a natural process Foster's accommodation was doubled.

It is to Foster that we owe the thorough course in practical physiology common nowadays throughout the English-speaking world. His pupils made the Cambridge School of Biology and Biological Research. Francis Balfour, who had been a keen naturalist while a boy at school, when he went up to Cambridge wished to study biology. He went to Foster for advice. In accordance with his habit Foster gnawed his moustache for a moment or two, sunk in thought, then his eye falling upon an egg lying upon the laboratory bench, he cracked the shell and showed Balfour the germinal disc floating on the top of the yolk, saying, "What do you think of working at that?" Balfour took the advice with enthusiasm, and became the founder of comparative embryology, incidentally building up at Cambridge a school of keen zoologists. As Foster's classes increased he realized more and more acutely the absence of any sound textbook on physiology. He was, therefore, impelled to write one; the work itself, first published in 1877, was such a success that the rest of his life was spent in bringing successive editions up to date. The labour was so great that he told Adami to take warning by him never to write a textbook:

> If it is a failure it is time thrown away and worse than wasted; if it is a success it is a millstone around your neck for the rest of your life.

The list of Foster's pupils includes such names as Sir Sydney Vines, Sir Francis Darwin, Newell Martin, Dew Smith, Gaskell, Langley, Sherrington, Henry Head, and many others who are handing on the torch they received from him.

British Medical Journal.

SATURDAY, AUGUST 23RD, 1913.

EUGENICS

SYDNEY SMITH in one of his letters said his friend Francis Horner was so extremely serious about the future of the human race that he had to compose his face half a street off when they met. At the present time we are all discussing the same problem, though in a more concrete form than that which formed the subject of the philosophic Scotsman's concern. The subject of "eugenics" is in the air; it is dealt with in the newspapers, and it has found its way in to light literature. In Ian Hay's last novel, *Happy-go-Lucky*, one of the characters asks another if he happens to have any sort of notion "what eugenics is—or are." The other replies hazily that he believes it is some sort of scheme for improving the physique of the race. It is characteristic of the all-pervading zeal for the regeneration of the race that the girl to whom the inquirer is engaged wishes him to become a local vice-president of the Eugenics Society. Even schoolgirls of 16 are familiar with the question, at least in theory, and freely discuss its practical application. There can be no doubt of the importance of human stock-breeding, and it was fitting, therefore, that a discussion on the subject should have been included in the programme of the Section of Medical Sociology at the recent Annual Meeting of the British Medical Association. A full report of the discussion appeared in the JOURNAL of August 2nd, and it is significant of the widespread interest now taken in eugenics that the debate was opened by a man of science not belonging to the medical profession, while among those who took part in it were an official of the Poor Law, a lady who is secretary of the National Association for the Feeble-Minded, a Russian anarchist of the philosophic kind, and a dignitary of the Roman Catholic Church. The debate, therefore, represented views of the most various kind, and it is this that forms its value as a contribution to a practical solution of the problem.

The discussion, if it had no other outcome, helped to place in a clear light the aim of eugenics. If any real reform is to be effected, it is vitally important that we should not be led astray into Utopian schemes by over-enthusiasm. Some put before them the ideal expressed long ago by Walt Whitman, whose prophetic vision saw a race of supermen among whom there should be no bodily defect or disease:

> When America does what was promis'd,
> When through these States walk a hundred millions of superb persons,
> When the rest part away for superb persons and contribute to them,
> When breeds of the most perfect mothers denote America,
> Then to me and mine our due fruition.

This goes further than our most advanced eugenists, for although they look forward to a population of "superb persons," as far as we are aware no one has advocated that the "rest" should "contribute to them." But some come pretty near to this aspiration of the poet. Only a short time ago a distinguished exponent of the new science thought it necessary to explain that eugenists did not deny to those who would not find a place among the poet's "superb persons" the right to live. This may come; the principle of making undesirable offspring "part away for superb persons" was recognized and acted upon in ancient Greece. In the meantime the saner reformers will doubtless be content to accept the more modest ideal of Dr. Harry Campbell, who defines the object of eugenics as the promotion of the welfare of the human race by encouraging biologically suitable and discouraging biologically unsuitable matings. It is, in fact, to use his own phrase, the "science of man breeding."

That this has been deplorably neglected is unquestionable. More than twenty years ago, when a famous racehorse was sold for a large sum for stud purposes, we dwelt on the striking illustration of the relative value placed on animals and on human stock afforded by the fact that, whilst a horse was judged unworthy to beget issue because he was a "roarer," many owners of such an animal would have had no objection to allow their own offspring to marry into families in which tubercle or other hereditary disease was handed down from one generation to another as an inalienable heirloom. We pointed out that a diseased inheritance was sometimes, as in the case of gout, actually boasted of as a mark of blue blood. It was added that, under existing social conditions, it was vain to hope for any great or general improvement in these respects, though a family doctor gifted with the necessary tact could often use his influence advantageously for the prevention of undesirable marriages. If a fraction of the care exercised in the breeding of horses were used in the propagation of the human species, there might be a hope that the race would be vastly improved.[1] Darwin, in his *Descent of Man*, wrote: "Man scans with scrupulous care the character and pedigree of his horses, cattle, and dogs before he matches them; but when he comes to his own marriage he rarely or never takes any such care. . . . Both sexes ought to refrain from marriage if they are in any marked degree inferior in body or mind; but such hopes are Utopian and will never be even partially realized until the laws of inheritance are thoroughly known." There is nothing new, therefore, in the eugenic doctrine except the disposition now shown to push it to extremes in its application.

Dr. Campbell contrasts man's interference with natural selection with the method of Nature. Man, he says, is seeking to obtain efficiency by bestowing infinite pains on the individual. Nature's method, which has been in operation since the first dawn of life, is not that of bolstering up the unfit but of wiping them out. Her chief concern is to produce the best and to secure the survival of the best. In regard to this, we may ask: When people talk of wiping out the unfit, and the survival of the fittest, what exactly do they mean? The fittest for survival in the struggle for existence are not necessarily by any means the best from an ethical point of view or the most likely to promote the welfare of the human race. This truth was set forth with his usual lucidity by Huxley in his Romanes

[1] BRITISH MEDICAL JOURNAL, November 28th, 1891.

lecture (1893). He there pointed out that we commonly use "fittest" in a good sense with an understood connotation of "best," and "best" we are apt to take in its ethical sense. But the fittest which survives in the struggle for existence may be and often is the worst. He adds that the ethical process is in opposition to the cosmic process to which the struggle for existence belongs. Some eugenists in their concentration on physical fitness lose sight of the moral qualities that have raised man to the place which he now occupies in Nature, and that most encourage the hope of his ascent to still higher planes. Dr. Campbell, indeed, holds that man is still evolving and will continue to evolve in the moral sphere. This is true to a certain extent, but it has nothing to do with natural selection. When Dr. Campbell declares that "the lazy, the intemperate, the dishonest, the aggressively antisocial, those who love not home life, those who shun the cares and self-sacrifice demanded of fatherhood and motherhood—these are one and all being eliminated, while their opposites are surviving and the attributes which secure their survival are being racially accentuated," we can only say that a man who believes this must be an optimist of the highest degree. It is one of the signs of the times that men and women alike shirk their duties as citizens, help in the perpetration of "racial suicide," and live solely for pleasure. Men avoid the service which they owe to their country, and the feeling of patriotism which has made our "rough island story" a large part of the history of the modern world, is scoffed at by an increasing number of our people as a superstition. Women think more and more of "expressing themselves," and, like Nora in *The Doll's House*, slam the door on the traditions in which the British race has been bred for so many centuries, and go forth to lead their own lives. So far from seeing the signs of moral evolution that are visible to Dr. Campbell, we see a gradual sapping of the moral character of the nation akin to that which finally brought the Roman Empire to ruin.

At first sight there may seem to be an antagonism between the aims of the physician and those of the eugenist. The object of medicine is to preserve life regardless of the good or bad qualities, moral or physical, of the individual; and, since hygiene has become more and more an active factor in the safeguarding of the health of the community, especially during the last fifty or sixty years, an incalculable number of lives have been saved which, from the eugenic point of view, might be described as undesirable. In the discussion on eugenics at Brighton great stress was laid on this point by Mr. Edgar Schuster, who, while stating that in this respect medicine might be accused with some justice of being dysgenic, thought it necessary to defend eugenists from the suspicion of antagonism to the art of healing. If doctors as a body are not very enthusiastic about what is called the science of eugenics, it is because as practical men who have to deal with the actual facts of life they are more than doubtful whether such a thing as the science of eugenics yet exists. Have we, in fact, got much beyond the knowledge embodied in the Horatian *Fortes creantur fortibus et bonis?* And the ancients understood that this was by no means invariably true, for they had a proverb, *Filii heroum noxae*, which seems to show that they knew the progeny of great men are often degenerate. There is so much that is obscure in the whole matter of generation and the transmission of qualities or constitutional characteristics, that the medical profession is fully justified in warning enthusiasts against radical measures for the prevention of procreation by the "unfit."

What is the practical outcome of eugenic doctrines? Is the marriage of human beings to be reduced to a system like that which Touchstone calls the "copulation of cattle"? This is vehemently denied by most eugenists; but their teaching carried to its logical conclusion certainly points that way. Some tentative experiments in that direction have been made; for instance, in the Oneida Community founded by J. H. Noyes, and by Friedrich Wilhelm, father of Frederick the Great, who tried to "propagate procerity" by marrying his gigantic Guards to such tall women as he could find. Neither of these experiments was very successful. The difference between medicine and eugenics lies in the fact that while medicine looks to the individual first and only indirectly to the race, eugenics cares nothing for the individual, but solely for the race. And though the whole subject of heredity is still wrapt in darkness, enough is known to show that if the ardent eugenist had his way the world would be the poorer both in genius and in many of the qualities which make for the goodness of men and the happiness of human life. Not only literature, art, and philosophy, but statecraft and the safety and greatness of the empire, would suffer to an extent beyond all conjecture.

The segregation of the mentally deficient is justifiable at once in their own interest and in that of the community. But surgical sterilization would not be accepted by the Legislature or by public opinion, and would lower those who practised it to the level of the hangman. This would inevitably bring discredit on the whole profession. It is the duty of the doctor to do his best by reasoning and moral suasion to prevent the marriage of persons whose offspring are likely to be diseased in body or mind. In Dr. Campbell's words, he should foster the development of a eugenistic conscience. Nowadays, however, the chief difficulty would seem to be to get people of the better classes to marry at all. As to legislation, we entirely agree with Mr. Bateson, who in his address on heredity published in the JOURNAL of August 16th, protests against the organization of "a wholesale tampering with the structure of the population such as will follow if any marriage not regarded by officials as eugenic is liable to prohibition. . . . This measure," he adds, "we are told is actually proposed in certain States [of the American Union]. Nothing yet ascertained by genetic science justifies such a course, and we may well wonder how genius and the arts will fare in a community constructed according to the ideals of State legislatures." The law can surround the marriage of those who are deemed "unfit" with difficulties. Human nature being what it is, the inevitable result of these difficulties would be that the ceremony of marriage would be dispensed with, and the unfit would propagate degenerates with the added stigma of illegitimacy. Hence those outcasts would be brought up in the unfavourable environment which illegitimacy brings in its train. Love which laughs at locksmiths will as readily laugh at law. Nature, even if it be expelled for a time by the parliamentary pitchfork, will inevitably come back and claim its rights. All that can prudently be attempted in the present state of knowledge is to regulate natural instincts, when this appears to be desirable in the interests of the community, without looking at human beings from the standpoint of the stock-breeder and treating them by his methods.

CRIME AND PUNISHMENT.

In his weighty contribution to the discussion on crime and punishment, held in the Section of Medical Sociology at the recent meetings of the Association, Sir Bryan Donkin said that in most writings, ancient or modern, informed or ignorant, there was a prevalent lack of definitive use of the words "punishment" and "crime." This lack of definition, or rather this want of agreement as to the connotation of the terms employed, is the cause of much avoidable confusion and barren argument whenever crime and criminal responsibility come under discussion. The disputants and their auditors, in fact, mostly "come out by that same door wherein they went." The profound thinker and lucid expositor—and as an example Dr. Mercier's remarkable book, *Criminal Responsibility*, may be quoted—takes infinite pains to analyse the content of the terms he uses, and explain the values he attaches to them. Such definitions may be arbitrary; indeed, when dealing with matter so disputable as wrong-doing, so plastic as law and so progressive as penology, they are almost bound to be so; but, whenever there is general consent as to definitions, the ground is not only cleared, but the foundations are laid for the erection of practical principles.

The papers of the three openers of the discussion, each in his own department perhaps the most authoritative voice in this country, should do much in this way to pave the path of progress. Each emphasized the essentially antisocial character of crime, Dr. Mercier considering criminal or antisocial acts broadly as wrong-doing, and Sir Bryan Donkin more strictly as acts deemed to be antisocial, and forbidden on the part of the State by enactments provided with legal sanctions. With no intention of entering here into the philosophical consideration of crime as defined by the last-named speaker, it may be well to allude in passing to one aspect, at times overlooked, of this great question. "Crime," Dr. Mercier said in his opening sentence, "is a consequence of the social state." But, further, what is deemed punishable in one form of social state is not so deemed in another—bigamy, for example—and what is not considered criminal conduct to-day—say, inebriety—may be so considered to-morrow—that is, law is the reflection of public opinion. The importance of this obvious and universally recognized relation between law and order on the one hand and public opinion on the other appears to be overlooked in its practical bearing on punishment. Any weakening on the part of the public of its respect for law and order or its abhorrence of criminal acts, any public condonation of criminal acts—following the doctrine of the irresponsibility of the criminal, the existence of criminal types, and the hereditarily predetermined and inevitable nature of criminal conduct—are bound to injure the law which society has built up in its own defence just as surely as the violation of public feeling by the infliction of unduly severe punishment will do so. In these days of growing contempt for convention, when many forms of antisocial conduct are regarded as mild eccentricities, when to go to prison and then write a book is almost as fashionable as it was at one time to shoot lions in Central Africa, it is well to be reminded, in the wisely conservative words of Dr. Scott, that a healthy public opinion, which loves order and deprecates crime, is a most important factor in social well-being.

Readers of Sir Bryan Donkin's paper will have noted the sentence printed in italics, "There is no 'criminal type.'" Sir Bryan states this without referring to any substantive investigations; but we presume he had in mind not only the results of his own long experience with criminals, but also the important anthropometrical work, which extended over some years, carried out in English convict prisons. This work appears to have established the truth of Sir Bryan's dictum, and to have disproved extreme Lombrosan views.

It cannot be too clearly recognized that, to again quote Dr. Mercier, "the root of all crime is the determination to obtain gratification for oneself regardless of the cost to others." With the criminal, as with the gorilla in one of Rudyard Kipling's stories, "there is too much Ego in his Cosmos." It is true that this bald statement leaves the question why there should be this preponderance of Ego outside consideration. It is equally true that for the purposes of practical penology this is precisely where this question—with certain exceptions, as Sir Bryan Donkin cautiously observes—should be left. These "certain exceptions" are especially the class of offenders in whom mental defect or disorder exists, though not to such degree as warrants certification as insane, and whose "criminal responsibility" is therefore held to be in question. Here we not only strike at the root of the whole matter, but attempt to dissect it. Unfortunately there is disagreement as to the *terrain* of the argument, and even upon the meaning and application of the term "responsibility," though here if anywhere there is vital need for attaching the same values to the words employed, if only by consent, to furnish a basis for argument. The position as expounded by Dr. Mercier is quite plain; for him, responsibility is liability to punishment or culpability. "A person is held responsible when the enlightened public opinion of his age and country demands that he shall be made to suffer in return for the pain that he has inflicted. *Responsibility* (our own italics) *is, therefore, not a quality of the person who has inflicted the pain, but a demand on the part of others that he shall suffer.*"

On the other hand, many, and possibly most, of those who use the term think of a man's responsibility for his actions as residing somewhere within his personality, just as they think of his goodness or his righteousness as so residing, though obviously these are judgements passed on him by "the enlightened opinion of his age and country." Sir Bryan Donkin's proposal to grade non-certifiable defectives according to the degree of their "responsibility" suggests that he is not in accord with the views set forth by Dr. Mercier, just as the French term "attenuated responsibility" lends colour to the view that responsibility or irresponsibility is attached, in the minds of those who use the terms, more to "the person who has inflicted the pain" than to "the demand on the part of others that he shall suffer." The first task of the proposed Committee to consider the present state of the law with regard to the legal responsibility for crime, if appointed by the Council of the British Medical Association, should be to come to a clear understanding on this point. In any case, however, it seems that, whether we accept responsibility as connoting liability to punishment, or, according to the other view, as the ability on the part of the subject of inquiry to conform to standards of behaviour set by his fellows, and irresponsibility as liability to err, we arrive in the end by different doors at the same tribunal—"the enlightened public opinion of our age and country."

The evolution and nature of punishment, its *raison*

d'être and justification, have been so ably treated in the papers from which we have quoted that we need do no more than commend them to our readers. The first law of society is self-preservation, and therefore society is compelled to take all measures, whether by the infliction of pain on wrongdoers, the intimidation of potential wrongdoers, or by reformatory endeavour, which it finds successful in securing its solidarity, so long as these measures do not conflict with the public conscience.

Sir Bryan Donkin, we hope, may presently find time to follow up one of his assumptions. "I assume," he said, "that the actual conviction and treatment by the State of persons guilty of law-breaking should be regulated, not only with regard to the degree of harm and menace to society involved in the crime, but also, as far as practicable, to the character and conditions of the individual criminal." The discrimination between one wrongdoer and another, according to the degree of responsibility or culpability involved in their acts, must take into account the character and conditions of the subjects. The modern tendency is to adjust the treatment to the criminal rather than to the crime. This tendency, which has come to be known as the individualization of punishment, is expressed in a number of modifications of criminal procedure, such as conditional release, the establishment of juvenile courts, and in particular, in America, in the indeterminate sentence. The indeterminate sentence is held to be that most in harmony with the results of scientific criminology, according to which crime is regarded as the expression of moral invalidity, requiring treatment as long as the invalidity continues. This sentence, which is said never to have been put into effect in the strict sense of the term, might, if applied logically, have some curious results. The homicide might be released a short time after his incarceration, whilst the petty thief might be detained all his days. This anomaly would undoubtedly have an injurious effect on the public conscience, the maintenance of which intact is one of the prime objects of the punishment of criminals. Nevertheless we welcome the observations of Mr. Jennings, Registrar of the High Court of Justice, who said that the present system of punishment was accompanied by too little discrimination, and suggested that in the case of more serious offences the final sentence might come for revision before a Punishment Board, which should have fuller information about the prisoner and his history than would be likely to come out in the course of the trial.

REORGANIZATION OF UNIVERSITY EDUCATION IN LONDON.

THE final report of the Royal Commission on University Education in London was issued on April 15th; summaries of its recommendations were published in the issues of the BRITISH MEDICAL JOURNAL of April 19th, 26th, and May 10th, 1913, and subsequently Professor Starling contributed two articles on the subject. The report made a large number of recommendations involving the interests of many existing institutions in London. The President of the Board of Education has now appointed a Departmental Committee to inquire and report, after consultation with the bodies and persons concerned, as to the steps by which effect shall be given to the scheme of the report of the Royal Commission, and to recommend the specific arrangements and provisions which may be immediately adopted for that purpose and as the basis of the necessary legislation. The Committee consists of Sir George H. Murray (chairman), Sir L. Amherst Selby-Bigge, Sir John Rose Bradford, Sir William S. MacCormick, Dr. George Franklin, Dr. Arthur Keith, Mr. John Kemp, barrister-at-law, and Mrs. Henry Sidgwick, with Mr. H. F. Heath, C.B., as secretary. The committee, as will be seen, has largely an official complexion. Sir George H. Murray, the chairman, is the Permanent Secretary of the Treasury, Sir L. A. Selby-Bigge is the Permanent Secretary of the Board of Education, and the secretary, Mr. H. F. Heath, C.B., is at the head of the university branch of the office of the Board; Mr. Kemp was joint secretary with him of the Royal Commission, and Sir William S. MacCormick, Secretary of the Carnegie Trust for the University for Scotland, was a member of the Treasury Committees on University Colleges in Great Britain and on the University of Wales, and Chairman of the Advisory Committee on University Grants. A series of articles by Sir Henry Morris criticizing the scheme for the medical department of the university have been published in the *Times* within the last few days. We hope on a future occasion to consider the views he expresses.

CONTROL OF VENEREAL DISEASES.

DR. R. W. JOHNSTONE, one of the medical inspectors of the Local Government Board, was instructed in April, 1912, to undertake an inquiry into the control over venereal diseases, with special reference to the adequacy and general character of the arrangements for institutional treatment in England and Wales. His report, with a prefatory letter addressed to the President by the Medical Officer of the Local Government Board, has just been issued.[1] Being addressed to the general public, it rehearses many facts with which all members of the medical profession are familiar, and its chief interest for them resides in the passage in which the means for the control of these diseases are discussed. Dr. Johnstone rejects the police regulation of prostitution, which was tried in this country from 1864 to 1886, when the Contagious Diseases Acts were in force, and has been tried in many European countries. The failure to check venereal diseases by such measures has been acknowledged not only in this country, but also in Italy, Denmark, and Norway, where they have been abandoned, and in France. Professor Fournier, though in favour of maintaining the existing system of police regulation of prostitutes in Paris, admits that it has failed to control venereal diseases in that city. The failure is attributed to two circumstances—first, that "clandestine" prostitutes form a more numerous and dangerous class of women than the acknowledged prostitutes; and, secondly, that the large majority of infected individuals are males. These considerations lead Dr. Johnstone to the conclusion that it is "obviously unscientific and unprofitable to attempt to deal with an infectious disease by repressive legislation directed against a particular class of sufferers, and those not the largest class nor the most dangerous." Further, "the injustice of applying pains and penalties to a particular class of loose livers of one sex, while those of the other sex are allowed to go free, is in itself sufficient to arouse the resentment and opposition of fair-minded people," more especially as the avowed object of police measures is to check venereal disease, not to suppress prostitution. The medical officer to the Board concurs in Dr. Johnstone's opinion that the notification of venereal disease is not at present to be recommended, on the ground, mainly, that in existing circumstances it would tend to concealment of disease and delay in a neglect of skilled treatment. Dr. Johnstone adds: "Full notification could probably be usefully introduced later on, but to make it effective, it should be accompanied by legislation designed to prohibit the treatment of venereal diseases by unqualified persons,

[1] H.M. Stationery Office [Cd. 7029], price 2½d.

as has been done in Australia and elsewhere, as well as by adequate provision for skilled diagnosis and satisfactory treatment." The main conclusion of Dr. Johnstone's report is contained in the following passage: "It cannot be too strongly urged that the best method of controlling venereal diseases and protecting the free from infection would be the provision of means for early and accurate diagnosis, with skilled advice and adequate treatment available for all infected persons. In short, the essence of the problem is how to get a willing patient at the earliest time to the doctor from whom, or to the institution from which, such advice and treatment are to be had." Dr. Newsholme emphasizes this view and expresses the opinion that a full inquiry is desirable into the measures which should be taken with this object and into the subject generally.

SIGHT TESTS FOR SEAMEN.

THE Board of Trade was never noted for its comprehensive grasp of things pertaining to eyesight, and it is not likely to improve until the simple fact is realized that members of the medical profession who make a special study of the eye are likely to know more about it than the lay officials of the Board or the retired seamen and clerks appointed to act as examiners in eyesight. Some hope was awakened when a Departmental Committee was appointed to investigate the question, but faith in it diminished when it was found to be largely composed of advocates of present methods. So strong was the feeling that the Imperial Merchant Service Guild would have nothing to do with it. The Committee's report has carried conviction to none, for it did little more than bless the present methods, although, as we pointed out at the time, it did recommend one or two of the things which have so long been known to be necessary. Their introduction has made a considerable difference in the published statistics, but in the main the results have been of little or no importance. At one time there seemed to have been a disposition to move in the right direction. New regulations were published which were to come into force next year. They proposed to raise the standard of form vision to six-sixths in one eye and at least six-twelfths in the other, and each eye was, of course, to be tested separately. In reply, however, to a question addressed to him in the House of Commons recently, the President of the Board of Trade stated that he had carefully considered the matter, and had decided that a candidate would be considered fit if he could see six-sixths when using either both eyes together or either eye separately. This means that a man may have one glass eye, or even if he still has his own it may have any degree of defect up to total loss of sight, but so long as he gets six-sixths with the other he is to be considered fit, although the fully competent man with six-ninths in each eye is to be rejected. That this is an illogical position becomes evident if we suppose the man with the blind eye (glass or otherwise) to have an accident which necessitated his keeping his only seeing eye closed. Is he still to be considered as more useful than his rejected companion who had six-ninths in each eye? But another notice has now been issued which shows no greater grasp of the subject. The Board's new instruction is: "That in future any candidate who already owns a certificate of competency of any grade who is presenting himself for examination for a higher certificate shall not be required to undergo any colour vision test." When it is remembered that the Board of Trade, owing to the fact that it employs examiners with no special training, has over and over again passed and rejected the same men, it can only be supposed that it hopes by this means never again to find itself in the particular dilemma in which it was in the famous Trattles case, where the candidate was alternately passed and rejected something like six times. Even then it was not decided whether he was dangerously colour blind or not; and finally a lawyer and several other non-medical men were called in to consider the evidence and decide the matter for the Board. At any rate, now a man may by excessive smoking or from disease have a central scotoma for red and green so that he would be unable to tell the colour of a signal light, and yet he will be assumed to be safe because, perhaps years ago, he was stated to be so by an examiner who knew nothing about optics, and had no acquaintance with the physiology of the eye. The strength of the feeling among ophthalmologists is shown by the fact, first, that the Ophthalmic Section of the recent Annual Meeting of the British Medical Association unanimously passed a resolution declaring that the sight tests of the Board of Trade are not satisfactory, and that an inquiry is urgently needed in the interests of the mercantile marine and the nation; and, secondly, that the corresponding section of the International Medical Congress adopted a similar resolution calling for an international committee to report on a suitable standard of form vision, colour vision, and light sense, in the interest of safety at sea, and also on the tests suitable for the examination. An inquiry seems to be necessary to convince the administrative authorities, although the question is really a simple one, and was solved some time ago by the British Admiralty. What is required are expert examiners who know the subjects on which they have to decide as to the fitness or otherwise of a candidate, and to allow them to use tests which are adequate for the purpose. At the present time men are appointed to make the examination who have no scientific training and not even much empirical knowledge of the subject, and are provided with tests which are so bad that no expert would rely on being able to detect many of the dangerously colour blind among those who present themselves for examination.

CANCER CURES.

REFERENCE was made in the report of the annual meeting of the Imperial Cancer Research Fund, published in the JOURNAL of August 2nd, to the fact that twelve alleged "cures" for cancer had been investigated. In every one of these cases it was found that the evidence did not bear out the claim. A brief account of some of them will serve to show the futility of the pretensions advanced on behalf of these cures. In one the disease was a round-celled sarcoma of the cheek, which had been twice operated upon. A third operation was refused, and the patient was treated by a herbalist with a remedy the composition of which was not disclosed, and at the same time by the patient himself with rose-leaves. It turned out that the owner of the remedy had himself suffered from epithelioma of the cheek eighteen years before, which had been cured, not by his own remedy, but by operation and subsequent skin-grafting! As *pièces justificatives* of another secret remedy two cases were submitted. In one of these cases a growth had been "extracted" which on microscopic examination showed no definite histological structure. No evidence was forthcoming that the patient's ultimate condition was due to the remedy. In a second case mammary tumours which had been removed proved to be not cancerous, but adenomatous. In a third case the claim had been the object of inquiry on previous occasions. So far as could be ascertained, it consisted in the injection of a solution of potassium permanganate. It was possible to identify four patients treated by the remedy. In one an operation had been performed for scirrhus of the breast. No recurrence took place in the scar. Later the supraclavicular glands became enlarged; they were not certainly malignant, and a second operation was not advised. After treatment by the "cure" the surgeon again saw the patient, when these glands were still in the same state. The medical man who was

stated to have operated on the second patient had been dead for many years, and no trustworthy information was obtainable as to whether there was any reason to suspect cancer or not. In the third case the patient was operated on for an obscure condition of the tongue; no certain diagnosis as between papilloma and epithelioma was arrived at, as no microscopical examination was made. Subsequently the patient went to a second surgeon with an enlarged gland in the neck. The gland was removed for microscopical examination. As the gland showed no signs of epithelioma, the tongue was not again operated on, and the diagnosis was entered as "lymphoid hypertrophy of the base of tongue." The patient subsequently underwent treatment with the "cure," which he speedily gave up as a waste of money. He is still alive, and in the same condition after several years. A fourth patient was suffering from multiple tumours in the neck. A surgeon removed one for microscopical examination by a competent pathologist, who reported it to be lympho-sarcoma. An operation was not performed, the patient underwent the treatment, and has since died. Other things put forward as "cures" were "brandy and egg," a "germicide" the nature of which was not disclosed, "liquid paraffin," and a mineral water stated to be radio-active. In these instances no evidence was advanced that any tumour had been treated. In the case of the mineral water, it was urged that it was already being tried in a well-known London hospital; inquiries failed to show that there was any foundation for this statement. Claims have also been submitted on behalf of preparations advertised as "cancer cures" in this country and on the Continent. As the result of the investigation no claims to cure cancer were substantiated. Any lump is called cancer, or, if the diagnosis of cancer has been established, either a cure has not been effected or the patient has been found to be already dead.

EUGENIC MARRIAGE LAWS IN AMERICA.

THE Governor of Pennsylvania recently signed a bill passed by the Legislature providing that marriage licences shall in future be issued only to those who can show that they are free from communicable disease. Under the new law marriage licences will not be granted to imbeciles, epileptics, or lunatics. Moreover, a licence will not be issued if at the time of application either of the contracting parties is under the influence of alcohol or any drug. The State Legislature of Wisconsin recently passed a bill making the production of a health certificate a necessary condition for the issue of a marriage licence. Another bill provides for the sterilization of criminal, insane, feeble-minded, and epileptic persons confined in State institutions. In regard to these measures, the Washington correspondent of the *Times* (August 13th) writes: "The much-advertised measure passed a few weeks ago by Pennsylvania appears already to be falling into obsolescence owing to the fact that the law does nothing except offer the unfit applicant the choice between perjury and humiliating and damaging admissions about himself. Nor does Wisconsin's more sensible law appear so far to be particularly effective. Such newspaper comment as the measure has elicited is rather uncertain in tone, while in a country where the Roman Catholic Church is so powerful and respected as it is here strict men of authority like Cardinal Gibbons cannot but greatly handicap the movement." The Cardinal is reported to have said before the American Federation of Catholic Societies that eugenics was only a fad. With reference to the Wisconsin laws in particular he said: "I don't like to talk on this subject, but marriage is something sacred, and it should be left to the man and woman to decide whether they wish to make the contract or not. No civil law should interfere." In reference to the sterilization of criminals, the correspondent from whom we have quoted says that the movement has not made much way in recent years. "While various States have more or less impetuously passed the necessary laws the statutes, except in two communities, do not appear to have been enforced." There is, he adds in a significant phrase, some tendency towards legislative activity and executive slackness in regard to the marriage laws. The explanation of the executive slackness here referred to may be that, whilst legislators pass measures to please faddists among their constituents ("Folks maun do something for their bread"), they, like George III on a certain occasion, make a note "to remember to forget" to provide the funds necessary to stir the law into effective life.

NATIONAL TEMPERANCE LEAGUE.

THE National Temperance League gave a breakfast to members of the International Medical Congress at the Grafton Gallery on August 8th, under the presidency of Sir Thomas Barlow, who, in the course of his remarks, referred to the remarkable growth of the temperance movement in almost every rank of society in this country during the last generation. It had made great progress in the army and navy, and the officers of those services now recognized their responsibility to teach both by precept and example. In commerce even men who did not abstain themselves recognized the value of having abstainers in their service, and the fact that alcohol took away the sense of control had been brought home to every one by the growth of rapid means of transit. The decrease in the administration of alcohol in hospitals was nothing less than a revolution; whereas in the old time it was ordered as a matter of course, the doctor now felt that when he ordered alcohol he should prescribe how much was to be given, and for how long. In spite of all that had been accomplished the drink bill was still enormously large, and he appealed to his hearers to exercise common sense with regard to medicated wines, the growing use of which he strongly condemned. Sir Victor Horsley and Sir Alfred Pearce Gould also spoke in support of the temperance movement. Dr. Wu Lien Teh, director of the Chinese Medical Service, said that so far from Chinese doctors losing practice for failing to administer alcohol, they would do so if they administered it.

A BACTERIOLOGICAL MUSEUM IN LONDON.

THE new bacteriological museum at the Royal Institute of Public Health, which has been made possible by the generosity of Sir William Lever, was thrown open to general inspection on the occasion of a recent visit of press representatives, and the significance of the various items in the collection was explained by Professor William R. Smith, M.D., the Principal of the Institute. The museum occupies a large room on the ground floor overlooking Russell Square, and although doubtless much has yet to be added, the display is already very interesting. On two sides of the room the walls are lined with glass cases containing a collection of micro-organisms, pathogenic and non-pathogenic, as well as specimens illustrating the pathological lesions produced by certain organisms in the body, and others showing bacterial products with remedial agents. The organisms are arranged in groups in order to illustrate their typical growth and the biological characteristics which lead to their identification. The cultivation of the organisms in different media is exemplified, as, for instance, the reactions of *B. coli* in agar-agar, broth, gelatine, and various sugars. A remarkable feature of the museum is the display of photomicrographs, nearly a thousand in number, chiefly in the form of transparencies. These are arranged in front of the windows, but in such a manner that they can be artificially illuminated from behind if necessary. For a large

proportion of these records, which show the appearance of micro-organisms at various magnifications, the Institute has to thank Professors Bujwid and Nowak, of the Cracow University; and for another valuable exhibit, consisting of a complete series of vegetable and mineral poisons (which is to be found in the section of forensic medicine and toxicology), it is indebted to the Society of Apothecaries. Among the interesting exhibits closely concerned with public health are examples of good, bad, and indifferent water, and of contaminations in milk; and another section is given over to demonstrations of the various serological reactions. These, together with pathological atlases and the like, complete a collection which will be permanently preserved and made available for the student. The museum, we understand, represents a cost of something like £600. On the occasion of the press reception Professor Smith summarized the history of the science of public health during the twenty-seven years of the Institute's existence, and also described the present work of what, as he said, was really a public health training college, with activities as diverse as medico-legal inquiry and instruction in domestic hygiene. Subsequently the visitors went the round of the bacteriological, serological, and chemical laboratories, and the water analysis room, and gained some idea of the assistance which the Institute is rendering the sanitarian, the jurist, the general practitioner and the public. The whole of the laboratories are now available for researches of a public health character, and for clinical investigations. The museum will be the laboratory's right hand.

HENRI ROCHEFORT AS A PATIENT.

IN the *Chronique médicale* of August 1st, Dr. Brochin gives some personal recollections of Henri Rochefort, who was his patient and his friend. It is interesting to learn that the pulse of the man who was described by Thiers as a *fou furieux*, and whose newspaper diatribes read as if they had been written at fever heat, did not as a rule exceed 52. Rochefort suffered from his youth from Reichmann's disease, which is defined as gastric hyperchlorhydria with dilatation of the stomach and continual hypersecretion throughout the intervals between meals. This may help to explain the corrosive acidity of his style. He had naturally a good constitution and was extremely temperate. He never drank a drop of wine and did not smoke. His only nourishment was 4 to 5 litres of milk a day. This statement, we presume, refers to his latter days, for we have ourselves seen Rochefort eat a hearty luncheon of the usual kind, and on that occasion he told the company that he drank wine at Sydney after his escape from New Caledonia by way of celebrating the event. From the therapeutical point of view he was a difficult subject to deal with, and could not bear any active medication. He never forgave a leading Paris consultant who prescribed large doses of bismuth, which he did not find to his taste. But if he did not love drugs he liked doctors, though rather for what he could learn from them than for the benefit of his health. M. Brochin does not mention that Rochefort had been a medical student, but his excitable nerves made him unable to stand the sight of a surgical operation. This was in 1850. All his life, however, he continued to take a keen interest in the progress of medicine, and hailed the results of the serum treatment of diphtheria with enthusiasm, for he adored children as much as Victor Hugo. He was one of the founders and a most generous benefactor of the Belleville Goutte-de-Lait dispensary, where more than 10,000 nurslings have been saved from death in the last twenty years. His name is inscribed in the list of founders with those of Victorien Sardou, Ludovic Halévy, and other well-known men of letters. Although he had fought fourteen duels, he was a man of extraordinary sensitiveness, and although he would have killed his man without compunction, he would not have fired on a rabbit. In fact, he had the temperament of the antivivisectionist, for although he took pleasure in causing mental pain to his fellow men with a pen steeped in vitriol, he could not bear the sight of a suffering animal. He was himself very intolerant of physical pain. He had many friends among members of the medical profession. He was linked by ties of friendship with Péan, Robin, d'Arsonval, Fournier, and many others. There was a great contrast between Rochefort, the rabid pamphleteer, and Rochefort, the private gentleman. He had the manners of the *grand seigneur*, which he was by birth, and if he mixed with the crowd it was obviously more from the necessity of his profession than from taste.

ADVERTISEMENT BY PROXY.

WE are all familiar with the too grateful patient who advertises in the local papers his recovery from a serious illness, "coupled," as the organizers of post-prandial oratory say, with the name of the doctor who wrought the "miracle of cure." In the majority of such cases it is probable that the doctor has done good by stealth and blushes to find it fame; but sometimes the inspired paragraph may be a veiled advertisement. After all, there is nothing worse in these harmless, if unexciting, bits of news than in the announcements which appear from time to time in that Pharos of journalism, the *Times*, that Sir Snobby Stitcher has been called in to the Duke of Bareacres, whose noble blood has incarnadined the common highway as the result of a collision between his motor and a village pump. We have found an example of a subtler form of advertisement in the *Journal de médecine de Bordeaux*. The following announcement appeared not long ago in the daily papers of that joyous city: "An American millionaire who has come on purpose to Bordeaux would be grateful to any one who should inform him as to doctors capable of curing his tuberculous daughter and his syphilitic son. £4,000 if cure effected. Write to B. S. R., Agence Havas." Bordeaux ought to be proud of being selected as the place of all others where this millionaire Diogenes looks for a man—that is to say, a man likely to cure his afflicted offspring. His publication of the nature of their diseases, though a trifle offensive to a fastidious taste, may, perhaps, be excused by his parental anxiety. This unusual procedure seems to have been justified by its success, for a few days later there appeared a second advertisement to the following effect: "The American millionaire thanks his correspondents, and has chosen Dr. X., of Bordeaux, as all the letters received recommended him for the treatment of his tuberculous daughter and syphilitic son." We can only hope that the fortunate practitioner selected for the purpose may be successful and may get his fee. But a few questions may suggest themselves to the inquiring mind. Why should an American millionaire go to Bordeaux for a doctor, and why should he advertise for one in the papers? No doubt there are first-rate doctors in Bordeaux, but there are surely plenty of physicians in America who would be capable of treating the patients whose condition has thus been made public. If the millionaire pinned his faith on French science, why did he not seek what he wanted in that city of light, Paris? A curious point in this strange story is the rapidity with which the right man was found. Still more remarkable is the fact that his modest merit—for his name does not seem to be famous in Bordeaux—should have been brought to light by all those who answered the millionaire's appeal. It would seem that when the good folk of Bordeaux—or at any rate such of them as are philanthropic enough to take an interest in the sorrows of a wealthy stranger—do agree, their unanimity is wonderful. Or is it possible that the correspondents who sang the praises of Dr. X. may be a stage army consisting, perhaps—horrid thought!—of himself?

TRYPANOSOMIASIS.

In the *Annals of Tropical Medicine and Parasitology* (August 11th, 1913) J. W. Scott Macfie describes what he believes to be a new species of human trypanosome. The parasite, he states, differs in several respects from the typical strain of *T. gambiense*. In man it produces a form of sleeping sickness, that is relatively mild, and occurs most commonly in young people, in which the trypanosomes are, apparently, either absent from the peripheral blood altogether, or present in such small numbers that hitherto they have not been detected. To the smaller laboratory animals the strain seems to be but slightly pathogenic. The morphology of the trypanosome as it appears in the blood of a guinea-pig shows some peculiar features. The trypanosome is smaller than *T. gambiense;* the cell protoplasm when well stained is homogeneous, and there appear constantly in the blood films a very few minute parasites measuring as little as 8 μ in length. Some of the short and stumpy parasites have the nucleus situated far forwards at the anterior (flagellar) end of the body. The occurrence of a few peculiar trypanosomes which appear to have a flagellum free in its whole length is also remarkable. Considering the morphological features of the parasite and the peculiar symptoms of the disease produced by it, the author is convinced that this trypanosome from Nigeria cannot be regarded as belonging to the same species as *T. gambiense*, and therefore proposes for it the name *T. nigeriense*. It is doubtful if protozoologists will accept this new species on the evidence so far produced. Absence of virulence of the disease is not peculiar to Southern Nigeria, but has been observed in various parts of the West Coast as well. The symptoms of some of the chronic forms of the disease described are typical of sleeping sickness generally. The presence of very short forms of the parasite, measuring only 8 μ in length, is interesting, but further observations of the strain in different experimental animals is required before a definite decision can be reached.

Medical Notes in Parliament.

End of the Session.—Parliament was prorogued on August 15th, after the Royal Assent had been given to a large number of bills, which, in addition to the Insurance Act (1911) Amendment Bill, included the Public Health (Prevention and Treatment of Disease) Act, the Mental Deficiency Acts for England and Scotland, and the Highlands and Islands (Medical Service) Grant Act.

Poor Law Medical Service (Treasury Grants).—In reply to Mr. Ginnell, the Financial Secretary to the Treasury said that such Exchequer assistance as was given in England and Wales towards the cost of the Poor Law medical service formed part of the general subventions for Poor Law services, and could not be specifically earmarked.

Medical Service in Jamaica.—Dr. Chapple asked the Secretary for the Colonies whether he would call for a report from the Governor of Jamaica on the system of medical service on the island, with a view to its reorganization, in order to meet the pressing needs of the population. Mr. Harcourt said that the information at his disposal indicated that the medical service of Jamaica was as good as financial exigencies permitted and that every attention was being paid to its improvement. In those circumstances he did not feel justified in calling for a detailed report, but he would invite the Governor to say whether he considered that there were any serious grounds for dissatisfaction with the present system. Mr. Harcourt, in reply to further questions by Dr. Chapple, said that the total provision of hospital beds in the colony, so far as could be ascertained, amounted to 1,504, of which 207 were in the coolie wards of the various hospitals; the total population of the island, according to the census in 1911, was 831,383 persons; there were about seventy estates employing indentured labourers. Dr. Chapple inquired if the natives were not now excluded from the hospital. He also asked whether it would not be possible to so increase the hospital accommodation and improve the treatment of the natives that their efficiency as workers would be increased, and they would eventually be fitted to take the place and do the work of indentured coolies to a greater extent than they at present did. Mr. Harcourt said he could not answer that in detail, but he should hardly think, as there were 207 beds in the coolie wards, as against 1,504 for the whole of the island of Jamaica, that the assumption was justified. Dr. Chapple asked the Secretary for the Colonies whether he would take steps to provide that increased facilities were given to ordinary medical practitioners in the island of Jamaica for visiting the hospitals and for rendering such service as would enable them more effectively to cope with the increasing mass of contagious and other diseases. Mr. Harcourt said he would ask the Governor to consider whether increased facilities were required.

Mental Deficiency and Lunacy (Scotland) Bill.—The amendments of the House of Lords to this measure were considered and agreed to by the House of Commons on August 14th, and the bill received the Royal assent on the following day.

Sight Tests in the Mercantile Marine.—In reply to Mr. Walter Rea, Mr. Buxton said he had considered very carefully the representations which had been made to him with regard to the form vision standard which it was proposed to bring into force next year. That standard required a candidate to have normal vision in one eye and half-normal vision in the other. He had decided to make a substantial modification in this standard by omitting the requirement for the weaker eye and by making the standard normal vision only. To reach this standard a candidate would be allowed, at his own option, to use either both eyes together or either eye separately.

Highlands and Islands Medical Service Board.—Mr. McKinnon Wood informed Mr. James Hogge that the Board appointed to administer the Highlands and Islands (Medical Service) Act were as follows: Sir John Dewar, Chairman; Sir Donald MacAlister, Principal of the University of Glasgow; Lady Susan Gilmour, Honorary Secretary of the Queen Victoria Jubilee Institute for Nurses; Dr. McVail, of the Scottish Insurance Commission; Dr. Leslie Mackenzie, of the Local Government Board; Dr. John Macpherson, of the Lunacy Board; Mr. J. L. Robertson, Chief Inspector under the Scottish Education Department.

A SERIES of post-graduate lectures will be given in the school of dentistry of the Royal Dental Hospital of London, Leicester Square, during October and November. Further particulars can be obtained on application to the secretary.

The fifty-sixth course of lectures and demonstrations for sanitary officers organized by the Royal Sanitary Institute will take place during September–November next. Particulars can be obtained from the Secretary of the Institute, 90, Buckingham Palace Road, London, S.W.

The Home Secretary has issued an order dated July 30th and now in force extending the provisions of the Workmen's Compensation Act, 1906, to writer's cramp, but a person suffering from that disorder will not be entitled to compensation for a longer period than twelve months. The order also contains the following definition of nystagmus, which is now scheduled as "The disease known as miner's nystagmus, whether occurring in miners or others, and whether the symptom of oscillation of the eyeball be present or not."

England and Wales.

[FROM OUR SPECIAL CORRESPONDENTS.]

MANCHESTER AND SALFORD.

Infant Mortality in Manchester and Salford.

The recently issued Local Government Board report on infant mortality shows that for the years 1901–1910 Lancashire has held an unenviable pre-eminence in its high infant mortality, and some statistics for Manchester and Salford, gathered from the reports of the medical officers of health, may perhaps afford a clue to some of the factors at work in these two towns. The figures given are the number of deaths under one year per 1,000 births.

For the years 1901–1910 the average infant death-rate in Manchester was 160. The figures for 1912 are not yet available, but in 1911 there were 18,583 births, of which 780—that is 4.2 per cent.—were returned as illegitimate. The total infant death-rate was 156, but while it was 148 among the legitimate births, it reached 336—that is, about 1 in 3 among the illegitimate. In Newton Heath district the illegitimate infant death-rate was 452, in West Gorton 476, Bradford (Manchester) 478, and Openshaw 538 per 1,000. It appears to be acknowledged that the illegitimate are not as a rule less healthy at birth than the legitimate, and the figures given are frightful in their suggestiveness. As a matter of fact these infants are not wanted, therefore they die. Taking separate divisions of Manchester, the lowest infant death-rates are in Moss Side 84, and Withington 87. These are the least crowded and the more residential districts, and they have the lowest general death-rate for all ages, that for Moss Side being 12.01 and Withington 10.29, the rate for Manchester as a whole being 17.12. The highest infant death-rates are in Ancoats and Central, each 204, Beswick 211, and Crumpsall 242. Ancoats and Central are, perhaps, the most congested and poorest areas, with a large proportion of unhealthy dwellings, and their general death-rates for all ages are above the average—namely, Ancoats 26.26, and Central 25.45. The excessively high infant death-rate in Crumpsall cannot be explained in this way. It is by no means one of the most congested or unhealthy districts, its general death-rate being only 15.13, which is less than the average for the whole city. Its high rate cannot be put down to summer diarrhœa, which exacted a high death-rate in Manchester generally in 1911; in fact, the infant death-rate from diarrhœa in Crumpsall was only 24.6 per 1,000 births, while in Manchester generally it was 45, in Ancoats 76.4, Beswick 75.3, and Central 64.6, and at the other extremity Moss Side had only 7.6, and Withington 15.5. Neither can the high rate in Crumpsall be explained through measles, scarlatina, diphtheria, or phthisis, in all of which Crumpsall compares favourably with the rest of Manchester. Its proportion of illegitimate births is less than the average, nor is there any greater proportion of industrial married labour than in several other districts with lower infant death-rates. Its rate for the previous ten years (1901–1910) averaged only 119, compared with 160 for Manchester as a whole. Its population is only a little over 10,000, and, of course, statistics from so small a population are apt to vary considerably; but it is evident that in 1911 some unusual and unexplained causes were at work in Crumpsall which need further investigation. It is interesting to note that the contiguous district of Cheetham, which is far more crowded and poorer than Crumpsall, has an infant death-rate of only 110, which is considerably less than half that for Crumpsall. Cheetham is the Jewish quarter of Manchester, and though perhaps cleanliness is not characteristic of the Jewish quarters, there is extremely little drunkenness. The Jewish mothers do not as a rule go out to work, and they generally give their children the breast for the usual time. The advantage of this cannot better be shown than by the table quoted below from the report of the medical officer of health for Salford. The infant death-rate for Salford in 1911 was 154, but in 1912, when there were 6,227 births, the rate had fallen to 130, largely owing to the lessened incidence of summer diarrhœa. Just as in Manchester, the extremes in the different districts are very great, the Albert Park district having an infant death-rate of 69, and Kersal 74, while Islington has a rate of 192, and Trinity 173. The table is obtained from the results of systematic visits and inquiries by the lady health visitors. The

Feeding of Infants born in 1911 in Salford visited and watched by the Health Visitors.

	Number of Births.	Infant Death-rate per 1,000 Births.
Breast and other food from birth ...	112	357.1
Breast 1 month, other food 5 months ...	181	237.6
Breast 2 months, other food 4 months...	158	291.1
Breast 3 months, other food 3 months...	113	159.3
Breast 4 months, other food 2 months...	82	146.3
Breast 5 months, other food 1 month ...	79	126.6
Breast only, 6 months	4,127	96.2
Other food entirely	353	388.1
Children died under 1 day...	62	—
Totals	5,267	145.2

rates given are not comparable with the general infant death-rate, as the figures are confined to infants born in 1911 and watched until they died or were 12 months old, but they show in a remarkable way the enormous advantage to be derived from breast feeding.

LIVERPOOL.

Housing and Rehousing.

The Housing Committee of the Liverpool Corporation, in presenting its last annual report, takes occasion to review the work of the committee from 1864 to the present. Prior to 1885 its activities were confined to the demolition of insanitary property. This led to the persons displaced overflowing into the immediate neighbourhood, where they went into sublet houses, increasing the number of the latter and also increasing the number of insanitary cellar dwellings and adding to the overcrowding in the city. Down to 1896 about 10,000 insanitary houses had been demolished, 40,000 persons being in that manner displaced. Any new buildings that had been erected by the corporation or by private owners in the decade ending 1896 were at once occupied by the better class artisans, while the persons turned out of insanitary dwellings found themselves as badly off as ever. About 1896 it became the policy of the committee to restrict the use of its dwellings to persons actually dispossessed, but it was not till 1900 that provision began to be made for all such displaced tenants. A report issued in 1902 gave the number of structurally insanitary houses then existing in the city as 9,943. Since 1902 some 5,358 of these have been dealt with, leaving 4,585 (including 2,939 back-to-back houses) still in occupation. Up to the end of 1912 the cost of demolition and rebuilding amounted to £1,137,452. The interest and sinking fund at the present amounts to £48,015. Of this amount £10,792 is defrayed from the rents of the dwellings, while the balance, £37,223, falls on the rates (2½d. in the £). Against this expenditure is to be placed the marked amelioration in the social conditions of the tenants. Evidences of this amelioration are forthcoming from many quarters; the death-rate has fallen to half, typhoid has almost disappeared and phthisis is diminishing. The police returns show less crime, and even the casual observer can see that the children are cleaner and better clothed than before. In dealing with further insanitary areas the committee hopes to be able to transfer some of the dispossessed tenants to the suburbs. This transfer has become justifiable in view of the facilities for rapid transit afforded by the electric cars. Great interest has been manifested in the work of the Liverpool Housing Committee, and deputations from various large towns of the United Kingdom, the Continent, India and the Colonies, have visited and inspected the work.

Ireland.

[*FROM OUR SPECIAL CORRESPONDENTS.*]

OVERCROWDING IN IRISH ASYLUMS.

IN the course of a discussion on the overcrowding of the Mullingar District Lunatic Asylum at a meeting of the Joint Committee, Dr. L. Gavin, Resident Medical Superintendent, said the overcrowding at present was to the extent of 81 males and 88 females. The average annual increase had been abont 15 patients. It was decided to leave the matter over till the October meeting, and Dr. Gavin was asked to furnish a report on the feasibility of extending the short dormitories.

The Resident Medical Superintendent of the Monaghan and Cavan Asylum has reported that, owing to the very large number of admissions recently, the number of patients in the asylum had reached the very high figure of 943. As accommodation was only provided for 793, the house was overcrowded to the extent of 150, and if the admission-rate continued anything like what it had been lately it would be necessary for the committee to provide without delay some temporary relief, as it was almost impossible to put more beds into some of the dormitories, especially on the female side.

DERRY.

It is reported that the scheme of importing medical men into Derry City for the purpose of attending insured persons has broken down. Both the medical men who accepted the offer of the Federation of Friendly Societies have, it is stated, already left the city, and it appears probable that the Insurance Committee will now allocate all the insured persons to local doctors who have established a proper medical service.

MEDICAL OFFICER'S SUPERANNUATION.

At a recent special meeting of Sligo Board of Guardians, Alderman Jinks, in accordance with notice, moved that a superannuation allowance of £136 0s. 8d. be granted to Dr. John Laird, late medical officer of health of Sligo No. 1 (Rural) Dispensary District, this amount being two-thirds of his salary. Dr. Laird had held the position for a period of forty years and one month. Amendments were proposed to give him no retiring allowance, but these were withdrawn, and a sum of £125 a year was eventually agreed to.

Scotland.

[*FROM OUR SPECIAL CORRESPONDENTS.*]

CONTINENTAL PHYSICIANS IN SCOTLAND.

THE closing of the International Congress of Medicine in London has been followed by the arrival in Scotland of several large parties of Russian and German medical men and women. Some thirty or forty Russian alienists, including eleven ladies, were in Glasgow from August 13th to the 15th, and visited the Eastern District Hospital, the Epileptic Colony at Chryston, the Woodilee Asylum, Hawkhead Asylum, Gartnavel Asylum, and the University. On Friday evening, August 15th, the same party visited Edinburgh, and on Saturday morning the Russian medical men and women travelled out to Morningside, where Craig House was open for their inspection. Mlle. R. Lansberg (London) and M. Dimitrieff, a student in Edinburgh, acted as interpreters, and Dr. George Robertson, the Physician Superintendent, and the Craig House medical staff showed the visitors over the premises. The party included medical men from Moscow, Odessa, Novgorod, Kharkof, and St. Petersburg. They were entertained at lunch by the Board of Management of the Royal Edinburgh Asylum and Dr. Robertson, and partook of haggis to the accompaniment of pipe music. In the afternoon the party proceeded by train to Bangour Asylum Village, where they were received by Mr. James Gibson, Chairman of the Parish Council and District Lunacy Board, by Miss Lees, by Dr. John Keay, the medical superintendent, and others. A thorough inspection of the village was made, and much interest was shown in the open doors and the absence of walls round the institution. After partaking of tea the visitors returned to Edinburgh. A large party of German doctors and others, about 250 in number, including some ladies, having visited Edinburgh, went on to Aberdeen on the 16th. They were received by Professor Cash, the Dean of the Medical Faculty, and were shown over the university and other places of interest. The party is making a cruise round Scotland, and intends calling at Oban and Glasgow.

South Africa.

THE ANNUAL CONGRESS.

THE fourteenth annual South African Medical Congress was held in the second week of July in East London, at the invitation of the members of the Border Branch of the South African section of the British Medical Association.

Relation of the Medical Profession to Provincial Councils.

The proceedings were opened on July 8th by Sir Frederick de Waal, the Administrator of the Cape Province, who delivered an address on the relations of the medical profession to the provincial councils, including in his survey a reference to the attitude taken up on this subject by the Congress of 1910.

Among the leaders of the medical profession in South Africa there had been, he claimed, up to the present a good deal of misunderstanding in regard to the Act of Union. If this passed away and the opportunity of obtaining legislative reforms by means of the provincial councils were realized to the full, the medical profession would endeavour to influence public opinion so as to obtain from the provincial legislature some of those things for which it had been unsuccessfully striving in the past.

As an example of the benefits that might be expected to accrue the speaker referred to certain resolutions regarding the provision and maintenance of public hospitals which had been passed by the Congress of 1910. Recognizing that public hospitals had been placed under the control of the provincial councils the Congress caused these resolutions to be brought to the notice of the executive council of the Cape province and, the speaker believed, of other provinces likewise. In the Cape province the resolutions were brought to the notice of the executive council by a deputation and there was a free exchange of views. He had previously been in charge of the hospitals for some years as colonial secretary, but had never before had an opportunity of viewing matters from the standpoint of practitioners. He had, however, been converted to the views expressed in the resolutions, and these were embodied in their entirety in an ordnance which was passed by the provincial council. Hence as the result of co-operation between the medical profession and the councils the hospitals were now being maintained and controlled on lines fully according with the wishes of the former.

On the other hand the same congress passed resolutions hostile to the idea of any matters which related to the public health, or otherwise affected the medical profession, being placed under the control of the provincial governments, and later on when a general election was in progress a section of the profession embarked on a political campaign against any such arrangement. This hostility on the part of the Congress led incidentally to difficulty in persuading the provincial legislature to adopt its views regarding hospitals, and was in other respects, in the speaker's opinion, a grave error. The establishment by the central government of a department for the promotion and control of research work, and to deal with vital statistics and other public health questions affecting the whole union, was certainly very much to be desired; but it was by the local authorities that the real executive public health work of the country must be done, and these local authorities, the Act of Union prescribed, should be controlled by the provincial councils. Hence it would be much wiser if the medical profession, instead of agitating against the authority of these councils in matters of public health, co-operated with them in endeavouring to develop the work of municipal and other local authorities in the connexions indicated. Certainly in Cape province, and probably elsewhere, the executive committee of the

provincial council was always ready to accept advice on matters of a professional kind from recognized professional organizations.

One of the matters which these councils would have to decide was the question of the issue of licences for the practice of medicine; at present there was no uniformity in the amount annually paid by medical practitioners. In the Cape a fee of £5 was payable on registration, and an annual fee of £2 10s. was imposed if the practitioner dispensed medicine. In the Orange Free State the registration fee was £7 10s., and all practitioners had to pay an annual fee of £15. In Natal there was a registration fee and an annual fee of £5, while in the Transvaal only a registration fee was exacted. The speaker held that the registration fee should be the same in all the provinces, and that if there was any occupation which could properly be exempted from payment for an annual licence it was the medical profession.

At one time the medical profession in South Africa had appeared to be anxious to see established a general medical council for the whole union; but in view of the vast extent of the country it was open to question whether a council for each component State would not be preferable, as otherwise the government of the profession would fall into the hands of a few individuals out of touch with local conditions. In any case it was desirable that the Congress should keep more in touch with the local medical councils than in the past, so as to make sure that the views expressed in its resolutions were upheld by these bodies when they were officially consulted in regard to the legislative and other proposals.

The powers and duties of the new South African Committee of the British Medical Association would doubtless be considered. For years past the profession had sadly needed co-ordination, and the speaker was glad that there had at length been brought into existence a definite body capable of expressing to the Government and the public the views of the profession in regard to matters with which the interests of medical men were concerned. Undoubtedly this new South African Committee of the British Medical Association had a useful future before it, but its powers should be carefully defined if it was to serve the profession to the best advantage. South Africa as a whole had benefited by political union between its different states, and the speaker hoped that similar cohesion between the various sections of its medical population would produce equally beneficial results. Hitherto the medical profession had not exercised as much influence in the formation of public opinion in South Africa as was desirable, because it lacked the co-ordination of effort which this new South African Committee of the British Medical Association might be expected to secure.

President's Address.

On the conclusion of Sir Frederick de Waal's speech, the President of the Congress, Dr. J. Barcroft Anderson, delivered his presidential address, in the course of which he dwelt on the disadvantages from which the medical profession as a whole habitually suffered. The profession never was and never would be a rich one, partly because its services were rendered mainly to individuals by individuals, partly because its members were carried away by an enthusiasm for their occupation, to the neglect of their own interests. The legal profession enjoyed a monopoly as the exclusive interpreter of the law both to the public and to the Government, but the medical profession had no corresponding advantage. On the contrary, it had to compete against unauthorized persons of all kinds, and was unable to do so on equal terms, because qualified medical men refrained from advertisement. The legal profession was even vested with authority to imprison those who did not treat it with respect. No such power was desired by the body which represented the medical profession; all that it wished was to see its members continuously increasing their ability to perform their duties efficiently by increase of knowledge, and by abstaining from serving the public under conditions which were calculated to render their work of an inferior quality. Twenty years ago the medical profession in South Africa was so well treated by the public and by the State that the question of organization or self-defence had not arisen; but with the advent of a Cabinet whose prime minister and deputy prime minister had both been general practitioners the troubles in the Cape began. The more perfect the organization of the medical profession for self-defence, the greater would be the gain of the public. It would be much more satisfactory to the public if it could deal with a profession which was a principal, not the servant of any lay organization, which was conscious of its strength and of its dignity, and which was untrammelled by care for the necessaries of life and free to devote its talents to the public weal.

Special Correspondence.

BUDAPEST.

Compulsory Vaccination in Bosnia.—Oriental Phraseology.—Foundation of Laboratories for the Investigation of Cholera.—Noisy Health Resorts.—Outbreak of Black-pox in Fiume.

The passing of the bill which renders vaccination compulsory in Bosnia and Herzegovina, recently sanctioned by the King of Hungary, marks an epoch in the history of public health in those countries. The new law is far more drastic than those of more highly civilized states—as, for example, Austria, where even yet vaccination is not compulsory. In Bosnia and Herzegovina, on the other hand, under the new régime, parents are obliged to have their children vaccinated before they are two years old, save in the case of illness or constitutional delicacy or where the child has already been infected with small-pox. Every child, moreover, must be revaccinated on attaining its eighth year; and, should the operation be unsuccessful, it must be repeated within twelve months, or, if this also fails, within the next two years. The vaccinations are usually performed by the medical officer of health for the district; but, if the latter is unavailable, it may be done by any legally qualified practitioner, who is bound to report every case of vaccination to the local board of health. Although the Bosnian Government, so far, has been very successful in checking the spread of small-pox, there can be no doubt that the new law will do much to improve the state of public health in the two annexed states.

A little book on *Oriental Phraseology* has just been published by Dr. Ignacz Kimosi, containing a list of the most commonly used terms and phrases relating to first aid and surgery in the Hungarian, Russian, Greek, Roumanian, Bulgarian, and Turkish languages. Dr. Kimosi, who has already edited similar dictionaries for the use of French and German doctors, now contemplates the compilation of another for the use of Englishmen, in view of the large number of English doctors and nurses sent by the British Red Cross Society to the assistance of the Balkan armies.

The close of the war in the Balkans will doubtless be followed by a considerable extension of commerce between Hungary and the Balkan States; and the Hungarian Minister for Public Health has therefore decided to establish a number of laboratories for the investigation of cholera, an outbreak of which is now feared. The reason for this decision is the fact that the recognition of epidemic diseases, particularly cholera, requires expert bacteriological examination in specially equipped laboratories. A certain number of experts will be employed for this purpose by the Board of Public Health, and the investigations will be carried on partly in the new laboratories and partly in the bacteriological stations. The first two laboratories will be established at Orsova, on the Roumanian, and Hjvidek, on the Servian frontier, both towns being situated on the banks of the Danube.

For some years past the number of visitors to Hungarian summer resorts has been steadily decreasing, a fact which is all the more remarkable inasmuch as Hungary abounds in excellent spas, which might be expected to attract strangers. A committee sent by the Balneological Society to investigate the causes of this sudden loss of popularity, attributes it in great part to the noisiness of certain places. The report of the committee observes that although people go to health resorts for a rest, this is precisely what they cannot get. They are disturbed when they wish to sleep by the loud talking or singing of servants and of their

fellow guests, the walls in some hotels being so thin that every sound in the adjacent rooms can be heard, whilst doors are banged and bells rung without any consideration for the feelings of others. The street noises also form a legitimate ground for complaint, particularly the cries of the night revellers and the nocturnal singing in which Hungarian youth is apt to indulge to excess. The committee considers these causes sufficient to justify the desertion of Hungarian health resorts, and suggests that the following rules should be observed in every spa in order to ensure the comfort of their summer visitors: (1) Every effort should be made to render the baths quiet and orderly. The bath buildings should be situated at some distance from the hotels, whilst in the hotels themselves there should be no bars, and only a restaurant in the strictest sense of the word. Care should also be taken that the streets are made as noiseless as possible by laying down asphalt or macadamized pavements. (2) All unnecessary noises likely to disturb visitors should be carefully avoided. (3) Strict supervision should be exercised as regards the music in restaurants, cafés, and other places of entertainment, and bands should not be permitted to play after a certain hour. The inspector of baths should be empowered to enforce the observation of the foregoing regulations.

Very few fresh cases of black-pox have been notified in Fiume during the last fortnight, the number of cases in that town having previously amounted to 35. Nine deaths have occurred out of this number, and several of the patients, the majority of whom were very young, have been in grave danger. The cases have all been carefully isolated, and every precaution is taken in ports and railway stations to prevent the spread of infection by travellers. This present outbreak of black-pox (variola haemorrhagia) is the second of its kind that has occurred within the last decade in Hungary. Up to the present, however, few cases have been notified in any other part of the kingdom, and in each instance the infection has been traced back to Fiume, where, thanks to stringent isolation, the epidemic shows signs of dying out.

Correspondence.

THE FUTURE OF THE INDIAN MEDICAL SERVICE.

SIR,—There are few more interesting and remarkable movements at the present day than the rapid transformation of Indian conditions as a result of widespread higher education. It is only natural that the medical profession should share in these changes, and the effect is the greater owing to the conspicuous success of the great medical colleges in the country. This is becoming increasingly evident in the demands of Indians for a larger share in Government medical appointments. Those who have carefully watched the progress of events during the last few years will not be in the least surprised that educated Indians should be now demanding the abolition of the civil branch of the Indian Medical Service, or that they should expect the prize appointments, especially the professorships of the colleges which have educated them, to be handed over to them without delay. The first great success obtained by this movement was Lord Morley's much criticized order stopping any increase of the cadre of the Indian Medical Service, and the handing over of a number of civil surgeoncies to Indians. Although this order has been modified to some extent, because experience showed that it had a retarding effect on the progress of medicine in India, it still remains a potent force.

These changes are, however, a mere trifle in comparison with the effects which will ensue if a recent suggestion of the Government of India is actually carried out. This is no less than the virtual abolition of the right of Indian Medical Service officers to general private practice wherever it still remains an appreciable factor in adding to their incomes. The suggestion is that the order should apply for the present to all the professors of the medical colleges throughout India, who are to be limited to consultant and specialist practice, each in his own particular line. This is in theory a plausible idea. It is, however, clear from the Government of India's letter that the change is to be made in the interests of the "independent medical practitioner." It is at once obvious that the same principle applies, and must inevitably be extended, to every town where the independent practitioner makes a similar demand, and the result must be detrimental to the civil surgeon in each such town. This would eventually include every place where any practice worth having remains to officers of the civil branch of the Indian Medical Service, for it is well known that in all but a small fraction of civil surgeoncies in each province the private practice does not now cover the loss incurred by the lower grade pay drawn by civil surgeons during the greater part of their service as compared with that of their military brethren. It seems clear, therefore, that the introduction of the principle involved in the present suggestion of the Government of India will practically tend rapidly to bring about the abolition of the right of private practice for Indian Medical Service officers in civil employment. As, however, this right is guaranteed in the memorandum issued by the India Office for the guidance of all candidates for the service, it would appear to be impossible to apply it to officers now in the service, unless compensation which is acceptable to them is provided. The other alternative would involve a distinct breach of faith with these officers, and the result could not fail to be disastrous to the popularity of the service, which is already greatly diminished.

It is easy to foresee the effect of these proposals on the professorships at the medical colleges. It is well known that, on account of the high cost of living in the Presidency towns, no professor can live on his pay, plus the slight additions which would be derived from consultant practice, if the term "consultant" is to be rigorously interpreted as it is understood is to be the case; at any rate until he has been long established, and has had time to pay off the debt inevitably incurred. It is not too much to say that in Calcutta and Bombay the pay of a medical professor amounts to only half the expenses of keeping up the position expected of him. Granted that the pay will be sufficiently raised to continue to draw the class of men who have up to now adorned the medical colleges of India, the proposal to supply pure specialists is an excellent one. Without the utmost liberality in the new rates of pay suitable men will no longer be obtainable among the European members of the Indian Medical Service.

Meanwhile, those medical men in this country who may be contemplating becoming candidates for the Indian Medical Service should duly note its rapidly changing conditions, and will be wise not to count on any augmentation of their pay through private practice during any of their twenty to thirty years' service in India.

If the policy now outlined is to be persevered with, the time would appear to have come when the India Office should withdraw or modify the statement that private practice is allowed, so that candidates may know that they are entering a military service, with a civil branch possessing only administrative and hospital duties. In that case it would obviously be necessary that the pay should be revised on this basis. A frank policy on the part of the authorities has become very necessary if candidates are not to be misled, with the certainty of creating such bitterness as will sooner or later stop the entry of British medical men into the Indian Medical Service.—I am, etc.,

I.M.S.

THE CONTROL OF THE MILK SUPPLY.

A Practical Object Lesson.

SIR,—In his very interesting paper in the JOURNAL of August 16th, Mr. Harold J. Stiles says he has long been convinced that the reason for the prevalence of surgical tuberculosis amongst the children in this country is the prevalence of tuberculosis amongst dairy cows, and because it is the exception rather than the rule to sterilize the milk; and he comes to the conclusion "that under the present unsatisfactory legislative control of bovine tuberculosis and of the milk supply, sterilization of the milk is the only prophylactic measure we possess if we wish to safeguard our children against acquiring bovine tuberculosis." He admits, however, that 38 per cent. of the tuberculous bone and joint cases referred to in his paper, when examined, contained the human tubercle bacillus.

1. If we go to China, Korea, or Japan the rule is that no cow's milk is given to children, and yet there we find

prevalent just as much bone, gland, and joint tuberculosis as at home. In Ireland the infantile mortality in 1912 was only 86 per 1,000 births, as against 95 per 1,000 in England and Wales, and 111 (1911) in Scotland (1912 statistics not available). Now this low death-rate in that country is due largely to the fact that in the rural districts (where the infantile mortality is far lower than in the towns) the women nurse their children, yet in these very areas you meet all types of bone, joint, and gland tuberculous diseases. These facts would seem to show that in the prevention of surgical tuberculosis we must attack the disease, not alone as due to a milk cause, but also as arising from human contamination. Further, we want far more information as to how the bovine tubercle bacillus may be modified in the human body, and vice versa, how the human tubercle bacillus may be changed in the bovine environment.

2. Agreeing as I do with Mr. Stiles that milk is one source of surgical tuberculosis in children, I cannot go with him in his statement that if we wish to safeguard our children against acquiring bovine tuberculosis we must sterilize the milk. Looking at the question from a practical point of view, who, may I ask, is to sterilize the milk? Is it the dairy farmer, the various public health departments, or the consumer? Will any form of sterilization render a milk that has been altered either by additions to or abstractions from its constituents, or that is, from a nutritive point of view, defective, a good article of food? Should not the main feature of a milk and dairy bill be this: that the person who purchases milk is guaranteed that he is procuring an article of food that is as pure as it left the cow's udder? If sterilization is the final solution of the milk problem, why should the dairyman take any trouble in producing an article which should be absolutely pure, when he thinks sterilization will, as a final process, cover up all his sins of omission and of commission? Surely we must throw some initiative on the milk producer. If we take such enormous care as to our water supplies—especially as to the purity and non-contamination of the catchment areas—surely our duty is to be even more careful with an article like milk, which is a medium so easily affected by adverse influences.

Is the final word of the medical profession to the general public as to such constantly used articles as water and milk to be "sterilize them"? If so, I submit we are attacking the wrong end of the problem, and are opposing the present trend of medical science, which is that prevention is better than cure.

3. An ounce of practice is worth—according to the old saying—a pound of theory, and the following experiment will show how the milk problem may be faced in a more scientific way than by advising "sterilization."

In 1904 I got an extremely intelligent dairy farmer in the neighbourhood of Belfast to supply his customers (of whom I was one) with milk in sealed bottles.

In 1906, after, at my suggestion, visiting the famous dairy at West Huntington, York (you drew attention to it in the JOURNAL), established by Mr. Sorensen, nephew of Mr. Busck, of the well-known "Copenhagen Milk Supply Company," he adopted "clean milking"—that is, washing of the hands of the milkers and the udders of the cows, clean vessels, rapid cooling of the milk, and its distribution in sealed bottles, with, in addition, medical and veterinary inspection of the dairy.

In 1908 he decided, on my advice, to go a step further, and to have every cow tested by tuberculin by the leading veterinary surgeon in Belfast, and to keep no animals that reacted. He had then twenty cows, now he has one hundred, the herd consisting of cross-bred shorthorns, Jerseys, and some Aberdeen-poled-Angus. Every cow has a brand mark indicating that she has been tested; and the milk of this dairy is supplied to the two children's hospitals in Belfast, to the Maternity, the Ulster Institution for the Deaf and Dumb and the Blind, the Babies' Home, and to the Babies' Clubs. The milk costs 4d. per quart all the year round, and, as it is supplied in sealed bottles, does not need to be opened until it is placed in the nursery or table of any room for use. In very warm weather the bottles can be kept standing in a vessel of cold water.

When, under the health scheme of Her Excellency the Countess of Aberdeen, the Babies' Clubs were established in Belfast in 1906, and it was necessary in any cases (breast feeding is the ideal always taught), where the mothers were unable to nurse, to give milk to the very poor children, the milk was supplied, and continues to be supplied, from this dairy in this way: If the doctors who attend the Babies' Clubs recommend it in any case, the milk is delivered direct to the home of the child's mother at 2d. per pint, and, in order to encourage thrift, the mothers are obliged to pay one half, the Babies' Clubs being responsible for the other portion. One condition is always enforced, and that is that the mothers bring the children once a week for examination to the Babies' Clubs, unless the Babies' Clubs' nurse finds they are too ill to attend. In the report for the year ending September 30th, 1912, I read that 504 new babies were enrolled during the twelve months, in addition to those also in attendance from previous years; and when the year before last we had a very hot summer, the mortality among the children taking this milk was much lower than the general infantile mortality of Belfast, the weaklings sent from the maternity (the premature, twins, etc.) did well, and, what was most remarkable, there were practically no deaths from diarrhoea, which caused such a mortality in the autumn of that year, in the case of children using this milk. Further, so far as we can judge, since the establishment of these Babies' Clubs, bone, joint, and glandular tuberculosis have been rare among the children seen there.

Now another step will, I hope, in time be taken, and that is to adopt the plan suggested by Professor Bang, of Copenhagen, which is to isolate in a farmer's herd those cows affected with tuberculosis, and to feed the calves of those born of diseased mothers with the milk of those not affected, and to continue this process regularly until a non-tuberculous herd is the result, the wastrels either dying out or being destroyed, some compensation being paid by the Government. Can we in England, Scotland, and Ireland not learn a lesson from Denmark? At one time the cows in that country were free from tuberculosis, then the malady—introduced by the English shorthorn—became very prevalent, while now, by Bang's method, the herds have again been cleared of the disease. In Copenhagen to-day you can buy for an infant a milk in a sealed bottle which is guaranteed by the authorities as being a pure, clean, non-tuberculous article, and which can be used without any form of pasteurizing, boiling, or sterilizing. Is not this the ideal the medical profession in Great Britain should teach the public to aim at?—I am, etc.,

Belfast, Aug. 18th. JOHN W. BYERS.

SPECIAL HOSPITALS.

SIR,—The *Liverpool Daily Post and Mercury*, on August Bank Holiday, published a leading article on Mr. Bickerton's address in the Section of Ophthalmology of the British Medical Association, and referred incidentally to a leading article in the BRITISH MEDICAL JOURNAL. The article in the *Post* concludes:

> The association of eye and ear is quite indefensible. They have no connexion physiological, anatomical, or pathological. The relations between the eye and the big toe, and the ear and the big toe are more intimate than the relations between the eye and the ear. But we in Liverpool seem to have been fond of double harness surgery, as is illustrated by our eye and ear hospitals and our Skin and Cancer Hospital, in which a union of incompatibles has been attempted with ill results to science and practice. A divorce has been pronounced at the St. Paul's Eye and Ear Hospital, which now figures as the St. Paul's Eye Hospital, and the implied purpose of Mr. Bickerton's paper, to which the Editor of the BRITISH MEDICAL JOURNAL gives unstinted praise, is to bring about, if possible, further dissolutions of such unnatural unions.

Whether Mr. Bickerton's address admits of the construction put upon it by the leader writer of the *Post* is open to doubt, and there are statements in the article with which I am sure Mr. Bickerton would not agree.

A letter from a correspondent signing himself "F.R.C.S.," controverting some of the points raised, was printed in the *Post*, but elicited from the editor the comment:

> The statements on which we commented were published by the BRITISH MEDICAL JOURNAL, which would be a more suitable medium for controversy on such a subject than our columns.—Ed. *D. P. and M.*

A judgement with which I entirely agree, though it is difficult to understand why it was not made when the leading article came before the editor.

Under the circumstances, I venture to ask you, Sir, for space in which to discuss the article in question, which seriously affects the position of a great medical charity.

There is no question of "the cap fitting," for there is only one head to try it on. There is now only one special hospital in Liverpool which deals with both eye and ear cases—namely, the Liverpool Eye and Ear Infirmary, Myrtle Street. I am therefore bound to assume that the alleged injury to ophthalmic and aural surgery is charged to the account of the Eye and Ear Infirmary, though the responsibility was shared by the St. Paul's Eye (and Ear) Infirmary until that institution closed its doors to ear cases. It is interesting to note here that the staff of the latter hospital consists (even now) of one pure ophthalmic surgeon and four general practitioners who are also competent oculists and aurists, while the former hospital has been staffed for the last twenty-five or thirty years by pure specialists, some of whom nearly or entirely confined themselves to eye work. Even on these grounds alone it may be said that the paragraph quoted does, by implication, a grave injustice to the Liverpool Eye and Ear Infirmary, and is calculated to lower that hospital in the eyes of the profession and public.

Before the *Daily Post* countenanced an attack on the oldest special hospital in Liverpool it would have done well to make a few inquiries into the amount, kind, and quality of the work done there, and into the future plans of its staff and committee. Speaking for myself and the colleagues who assist me, we should have been only too pleased to give the representative of the *Daily Post* every opportunity and help it required. Fortunately, in this JOURNAL there is no need to refute the ludicrous assertions made in the passage quoted above.

Personally I have never defended the practice of compelling one man to do work of different kinds for one of which kind he had a disinclination, or for which he was unfitted by lack of training or of certain natural qualifications. For many years I have advocated the division of the staff into two main groups and a third smaller one consisting of those who from love of the work, long training, and the character of their private practice found it impossible to relinquish either of the two specialities. The third group would be gradually eliminated without injury to any one, and, as a matter of fact, this transformation is in progress at the present time. I am, however, a strong advocate for "double harness"—that is to say, I think there are many advantages to be gained by carrying on two or more specialities under the same roof. Two, three, or more horses can do better work more quickly and more economically when harnessed together than when drawing separate loads. On the same principle I think that a large general hospital with many special departments has great advantages over a number of isolated special hospitals, and in a less degree two or three specialities carried on in the same building afford one another mutual help. I will go further and say that I see no reason why, other things, such as energy and ability, being equal, a man who finds his recreation in golf or medical history should be a better practical ophthalmologist than another who finds part of his work and recreation in otology and rhinology. Personally I do not think that operating for cataract or glaucoma incapacitates me from doing an ossiculectomy or a delicate operation on the labyrinth, nor that a knowledge of labyrinthine nystagmus vitiates my diagnosis of other forms of nystagmus; nor, again, that a knowledge of the accessory sinuses of the nose interferes with an investigation of optic neuritis or proptosis or the treatment of dacryocystitis on true surgical principles.

There is one confession I will make: I believe that a man who confines himself to one speciality has more time and energy for research than one who works at two subjects; but, on the other hand, I find that in this country even the single-subject specialist, who has much hospital and private practice and who does research work of any value, is a rare and exceptionally energetic and able man. This failure to do research work is not entirely the fault of the specialist, for there is no endowment of research and no army of young men willing to work under the guidance of their seniors without the hope of immediate remuneration.

Although, in his Presidential address, Mr. Bickerton professes a preference for the "bare oculist" as opposed to the "complete oculist," and although he has close at hand the laboratories of the university, he honours the Liverpool Eye and Ear Infirmary by sending his specimens to the laboratory of that maligned institution to be cut, mounted, and examined, showing that he, at any rate, appreciates the value of the work done there.

I have referred to future plans. For years it has been the desire of some members of the staff (myself included) to organize the hospital on the plan of the New York and Boston Eye and Ear Hospitals, but owing to circumstances over which we have had no control our wishes have not been realized, though there has been for many years an informal partial division of labour.

Some of the difficulties have now been overcome; a large building adjoining the infirmary in Myrtle Street has been bought by the committee, and when the necessary funds are available it will be possible to provide a new ear out-patient department and 30 or 40 additional beds. At present the infirmary has 65 beds divided between the two specialities, and served by two operating theatres, the first floor being devoted to aseptic eye work and the second floor to ear work. It will probably be necessary to add to the staff, and it is hoped that eventually a complete and separate staff of surgeons will be provided for each department. Meanwhile I do not think the *Daily Post* or the large clientèle of the infirmary (about 12,000 new cases per annum) will find much reason to complain of the work done by the existing staff, even if the surgeons cannot all claim to be "bare oculists" and bare aurists.—I am, etc.,

HUGH E. JONES,
Senior Honorary Surgeon, Liverpool Eye and Ear Infirmary.

Liverpool, Aug. 18th.

THE NEED FOR THE PSYCHOTHERAPEUTIC CLINIC.

SIR,—The announcement in your columns quite recently that it is proposed to found a medico-psychological clinic in London, combined with the fact that such a clinic has been in existence in Liverpool for some little time, make this a fitting moment to call the attention of the profession to the need for such institutions.

It is known that psychotherapy has been and is daily practised by men all over the country, whether in the form of suggestion, hypnotism, persuasion (Dubois), education of the attentive control, or psycho-analysis. The increased interest shown by the medical profession and the public in general in mental therapy, and the undoubted stimulus derived from the brilliant achievements of the Vienna school in particular, make it imperative that the subject should be given a wider recognition. The establishment of clinics in the large industrial centres for the express purpose of carrying out the various forms of mental treatment are a need of the times, and but a reflection of the change of medical opinion in this direction. In addition to meeting an undoubted want on the part of suffering humanity, they would help to co-ordinate the efforts of those already working on those lines, and serve as teaching centres and foci for the dissemination of knowledge on the subject. The establishment of such clinics would, moreover, help to popularize this form of treatment with the general public and divest it of any residual aroma of charlatanism which may remain from former days. Hypnotism, for instance, is still unfortunately associated in many people's minds (and those not the least cultivated) with a species of histrionics and showman claptrap which hardly conduces to its serious consideration as a therapeutic agent. Thanks to the courage and perseverance of pioneers in this treatment, much of the unfortunate prejudice has been lived down, and it remains for a later generation to consolidate the success so hardly won by its predecessors. It is time, too, one would imagine, that a therapeutic agency, which on the Continent and in America has long been regarded as a legitimate item in the physician's armamentarium, should be accorded such sanction and status as are enjoyed by any other form of treatment. Any one who is acquainted with the psychotherapeutic clinics on the Continent, private or public, cannot but feel a little ashamed and mortified to think that Great Britain should lag behind in a matter of such prime importance.

Through the kindness of the honorary physicians, I was recently accorded an opportunity of visiting the Liverpool clinic, which has been open only about nine months, and which I understand is already more than

justifying its existence. It is to be hoped that other large towns will follow the lead of Liverpool and the metropolis, and that psychotherapeutists in the near future may enjoy the facilities that are available for the practitioners of any other speciality, and which are such an essential factor in its development.—I am, etc.,

Leeds, Aug. 11th. J. E. MIDDLEMISS.

ASSISTANT MEDICAL OFFICERS IN ASYLUMS.

SIR,—Your correspondent "A.M.O." gives a useful warning to prospective candidates for the asylum service. Prospects more barren or conditions more irksome would be hard to imagine. In scores of cases men are working after ten years' service with almost precisely the same pay as is offered to newly qualified men on entering. They reach the age of 40 and 50 and find themselves without privacy, living in two rooms, often overlooking the exercising grounds of the patients, with little independence of position or liberty. Their tenure of office entirely depends on the goodwill of their superintendent—in practice, whatever it may be in theory. Whilst it is very important for colleagues to work together amicably, this is too much power to be placed in the hands of one man. No other employees in the whole institution are treated in the same fashion. The chaplain, clerk, storekeeper and often even the latest-joined assistant attendant are provided with separate houses. Fixed leave on a liberal scale is given to the very scullery maids. The assistant medical officer in many asylums must make a personal request for even an hour's absence. If he wishes to do post-graduate work he must do his best during his annual leave. It has been urged that a year or two may be profitably and pleasantly spent at asylum work before settling down in practice. A worse training would be hard to imagine. There are to all intents and purposes neither midwifery, serious accidents, or infectious disease, and the surgery is almost everywhere quite negligible. Writing practically useless notes that nobody reads, supervising meals, bedding, and the state of the clothing are in many places considered of infinitely more importance than good clinical or research work. We have lately read in the medical and lay press able addresses deploring our lack of knowledge of the causes for the increase of insanity, and our inadequate methods of relief and cure. With superintendents burdened with a mass of routine details, and their colleagues living in the conditions described, what else can be expected? If committees or the public generally properly realized the present state of affairs they would put an end to a condition bad for the individual and infinitely worse for his patients.—I am, etc.,

August 9th. ANOTHER A.M.O.

LIGHT AMBULANCES FOR YEOMANRY REGIMENTS.

SIR,—The wagon described by Lieutenant D. G. Kennard, R.A.M.C.(T.) in the BRITISH MEDICAL JOURNAL for August 9th would no doubt be serviceable for parades and civilian life on good roads, but for the wear and tear of annual trainings, daily use, or for the strenuous work of active service it is immensely inferior to the admirably light cavalry ambulances which form part of the peace equipment of the mounted brigade field ambulances attached to the yeomanry brigades, and which are capable of being used in any country on or off the roads.

As a commanding officer I have had ample experience for the last six years of the light cavalry ambulances. I have used them at annual trainings, manœuvres, etc., in the most hilly districts in Wales, on and off the roads and in the open country, and with these well horsed with van horses, I know of nothing approaching their value; and I believe this is the experience of all officers who know these ambulances.

The statement "that more or less serious accidents occur on parade almost daily" is not in accord with my experience, in fact, during the recent training of my own brigade, the South Wales Mounted, consisting of three regiments of Yeomanry, a Transport Supply Column and a Field Ambulance, the only serious casualties were three, that is, cerebral concussion, compound fracture of the elbow, and severe abdominal injury. The minor casualties were under twenty, and I may add in previous trainings casualties were in the same proportion. I do not consider an ambulance necessary on parade except on special occasions, such as field firing, and most officers would consider a one-horsed vehicle such as the wagon described rather an impediment than a gain to a fast-moving unit, such as a yeomanry regiment. What is really required in a yeomanry regiment is the presence on parade of the regimental medical officer with his mounted orderly and equipment, on special occasions, and the utilization of the regimental baggage carts, which with little care can easily form an extempore ambulance, and that is all that is required, and not an extra wagon.—I am, etc.,

J. R. I. RAYWOOD,
Lieut.-Colonel R.A.M.C.T., Officer Commanding.
South Wales Mounted Brigade Field Ambulance.

Hereford, August 14th. R.A.M. Corps.

OPERATION FOR CHRONIC INFLAMMATION OF THE UTERINE APPENDAGES.

SIR,—I notice in the BRITISH MEDICAL JOURNAL of August 16th, on page 396, an account of a paper read by Professor Beuttner of Geneva, in which he describes a method of dealing with chronic inflammatory diseases of the uterine appendages, when it was possible to save one ovary, by excision of the tube, one ovary, and a wedge-shaped piece of the fundus uteri.

I have independently practised exactly this same procedure for some time as a routine measure in suitable cases, and I have at the present moment four patients recently operated upon under my care.

I was not aware that the paper was to be read, and, unfortunately, I was unable to be present at the sectional meeting, so I take this opportunity of bearing testimony to the great merits of this method of dealing with serious infections of the appendages in young women.

As I have described in detail and figured the operation as performed by me for the forthcoming edition of Burghard's *Operative Surgery*, I will not now give the obvious arguments in favour of it.—I am, etc.

Liverpool, Aug. 17th. W. BLAIR BELL.

THE TREATMENT OF PNEUMONIA.

SIR,—I have obtained the same result that Dr. Arnold describes in the BRITISH MEDICAL JOURNAL of July 12th, but I use salicylates and calomel, so that I venture to suggest he is mistaken in swearing by quinine, for the drug we use in common is calomel. So gratifying have the results been that I now meet these cases with complete confidence, whereas formerly I dreaded nothing so much as having to treat a case of pneumonia. Of course, pneumonia in a dipsomaniac is hopeless; it is only a question of how far the constitution has been undermined. Directly pneumonia has been diagnosed, I commence by giving 4 grains of calomel, which is continued in doses of 2 to 4 grains every day or every second day, according to the state of the bowels, till the temperature falls. In every instance the most noticeable favourable sign is the patient is able to get some sleep. Equally beneficial effect is seen in ulcerative tonsilitis with thick white membranous deposit or sloughy base, which may be said to clear up in double quick time. Of course, calomel in either case is used as a routine adjuvant and not as a specific. What I mean is, calomel lavage is looked upon as an essential part of the treatment with appropriate remedies, and not relied upon *per se*.—I am, etc.,

London, W.C., Aug. 14th. D. N. COOPER, L.R.C.P., etc.

A SECTION OF THE HISTORY OF MEDICINE.

SIR,—As the History of Medicine Section of the recent International Congress proved so successful, allow me to suggest that a similar section should be formed for each Annual Meeting of the British Medical Association.

In each town in which the Association holds its Annual Meeting, the amount of local material alone appears to me to justify the formation of such a section; and in no town more so than in the great northern city in which the Association is to meet next year. Aberdeen has not only produced some of the most brilliant members of the medical profession, but it has the credit of being the first corporation in the country to issue an edict for the segregation of syphilitics. This it did in 1495.

Leaving this proposal to the sympathetic consideration of our Council, I am, etc.,

August 14th. SENEX.

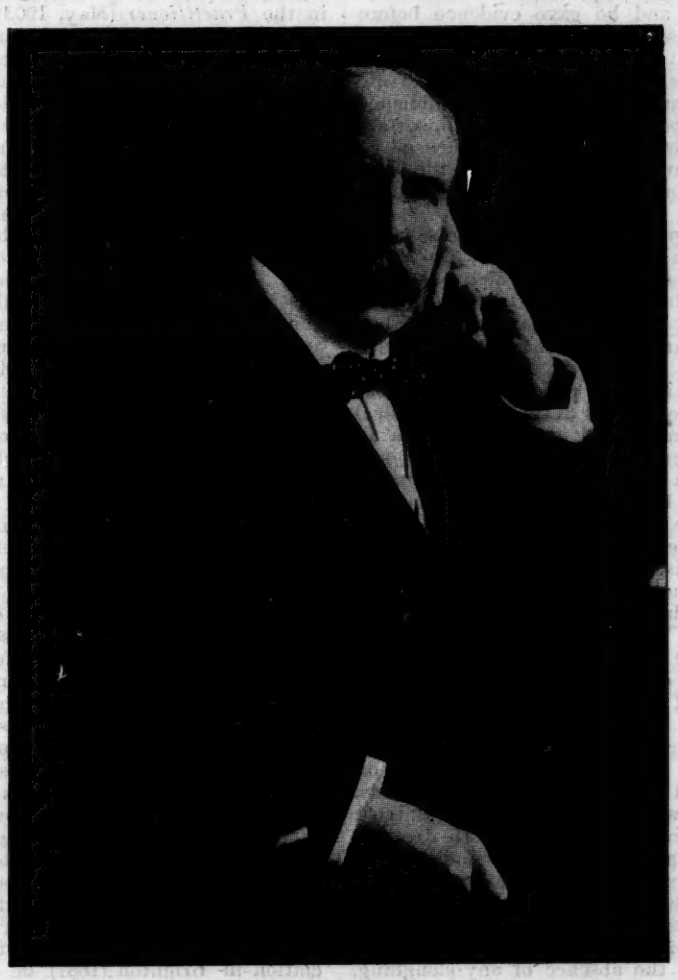
Obituary.

WALTER WHITEHEAD, F.R.C.S.EDIN., F.R.S.EDIN.,

CONSULTING SURGEON TO THE MANCHESTER ROYAL INFIRMARY; EX-PRESIDENT OF THE BRITISH MEDICAL ASSOCIATION.

WE regret to have to announce the death, on the evening of August 19th, of Mr. Walter Whitehead, President of the British Medical Association in 1902, when the annual meeting was held at Manchester. Some years ago Mr. Whitehead had an attack of cerebral thrombosis, and has since been in failing health; his death therefore was not unexpected, but has caused great grief to a large number of friends.

Walter Whitehead, the son of John Whitehead, who married Eliza Ellen, daughter of John Allanson of Tottington, was born at Haslam Hey, Bury, October 12th, 1840. His great-grandmother was a daughter of Robert Kay, inventor of the drop-box used in weaving, who was the son of John Kay, the inventor of the fly-shuttle, and his father's family had resided at Haslam Hey for upwards of 250 years. They had been bleachers at Lowercroft during the whole of that time. Robert Whitehead, of torpedo fame, was cousin to John Whitehead. From his earliest days Walter Whitehead seems to have been possessed of the family originality, for he tells us that at the age of 8, by unanimous vote of all his relatives, he was sent to an academy in the Isle of Man, the head master of which promised Mr. Whitehead, senior, that he would see a marked change in Walter at the end of twelve months. After three years' suitable treatment, during which, he said, he changed his dorsal integuments several times but without any commensurate development of character in the way hoped for, he returned home, and for six months was at a school at Altrincham, Cheshire. The atmosphere of this school was as relaxing as that of the former had been bracing; and as he thought it a point of honour for every boy to run away from school once in his lifetime, he walked home fourteen miles to Bury one day, making a detour of four additional miles to regale himself with Eccles cakes, then much appreciated by the youthful epicures of Lancashire. It was well that he did this, for no fatted calf was prepared for him at home, and next day, duly chastened, he was returned to school. He was next sent for a time to Making Place School, at Ripponden, near Halifax, where the head master acted on the principle of trusting his boys absolutely, believing that if put on their honour they would behave properly, and they did. These were halcyon days after the island experiences, and he naturally, as he says, became the head of the school in two years, and was awarded a silver cup, which was always one of his proudest possessions. Whitehead was as much impressed with the successful results of the original methods of the schoolmaster as he was with the personality of the man, and later in life he joined with many of his schoolfellows in placing a window in Ripponden Church to the memory of their revered master. It thus came about that he did well at school, though to his own surprise.



WALTER WHITEHEAD.
(From a Portrait by Elliott and Fry.)

At the age of 16 he entered his father's bleaching works, and, after the initial difficulty of putting to practical advantage in his new occupation anything he had learnt at school, he settled down and thoroughly enjoyed working for three years as an ordinary workman, at half a crown a week, beginning at the bottom and never getting any further. His facility as a boy for extracting the teeth of his younger brothers and sisters had awakened in him the desire to be a surgeon, and an invitation from a medical student, met whilst attending chemistry lectures, to see the operations at the Manchester Royal Infirmary rekindled his ambition. During the last year of his business career it was his duty to attend Manchester market each day, and his idea of fulfilling this duty was to spend most of his time in the company of medical students at the Infirmary, taking care only to call at the warehouse on the way home at night. This languid attention to business had the advantage of lessening the resentment of his parents when he announced to them that he had borrowed money and had entered the Chatham Street School of Medicine, Manchester. The delightful autobiographical details of the days of his youth: how he was bidding fair to rival his father's cousin, Robert Whitehead, of torpedo fame, by his youthful experiments with explosives; how he managed to inoculate a neighbour's cat, which was eating his pigeons, for which he got one shilling each for the table, with a dozen bullets from a pistol in daily doses; how when called in to diagnose the ailment he suggested lead poisoning, which a subsequent *post-mortem* examination enabled him to report as correct; and how he, his brothers and sisters were cured by his mother of a fondness for whist, are they not written in the chronicles of the medical students of Manchester (1902)?

He was at first apprenticed to Drs. Harris and Bennett, of Bury, and having in this way gained considerable experience in practice he was able to get temporary employment as locumtenent, on and off for eighteen months, to residents in the Manchester Royal Infirmary, but he never was appointed to any definite post there himself. He was also in residence for a time at the Withington Workhouse Hospital. He qualified in 1864 by taking the L.S.A.Lond., the L.F.P.S.Glasg., and the L.M.Edin., and he began practice at Mansfield Woodhouse, Notts., where he remained for four years. Whilst there he organized a village hospital with 8 beds; it has since been enlarged and rebuilt, and now has accommodation for 43 patients. In 1866 he took the diploma of F.R.C.S.Edin., and in the following year returned to Manchester and began general practice; in 1868 he was appointed surgeon

to St. Mary's Hospital for Women and Children. He resigned this post in 1873, when he was appointed honorary assistant surgeon to the Manchester Royal Infirmary. He became honorary surgeon in 1879, and remained on the active staff until 1900, when he retired on attaining the age of 60. For the last eleven years he was senior surgeon to the hospital. When he retired from the active staff he became honorary consulting surgeon. In 1881 he was appointed honorary surgeon to the Manchester and Salford Lock and Skin Hospital, and in 1888 he was instrumental in having the cases separated, and the Manchester and Salford Hospital for Diseases of the Skin was in consequence founded. He was also honorary surgeon for a time to the Christie Cancer Pavilion. He was actively interested in the establishment of day nurseries in Manchester, being medical superintendent of one in the slums of the town, and he gave evidence before a Committee of the House of Commons (1871) on the Protection of Infant Life.

In the first years of his life in Manchester he wrote many papers on various surgical topics, and he published during his active career about fifty articles in all, several of them recommending methods of treatment devised by himself. He was also an active member of the local societies, and was president of the Manchester Medical Society in 1885.

In 1870 he and his great friend, the late Samuel Messenger Bradley, began the publication of the *Manchester Medical and Surgical Reports*, which contained papers by local men chiefly. After two years the journal was amalgamated with a similar one published at Liverpool with the name of the latter town added to the title.

The most important of his earlier papers was on mucous disease (colitis), read at the meeting of the British Medical Association at Newcastle in 1870. It was published in an extended form in the *Manchester Medical and Surgical Reports, 1870.* This was a full and interesting account of the disease, of cases seen by himself, and a bibliography of 90 papers. It is all the more interesting, coming from Whitehead, as it is a purely medical paper. He strongly recommended the administration of potassium bromide over a period of many months, believing that it acted as a good anaesthetic to the nerves supplying the mucous membrane.

Whitehead will long be remembered in the history of surgery as the originator of two important operations—the one for the excision of the tongue, and the other for removal of haemorrhoids. They are always referred to in works on operative surgery. His first case of excision of the tongue by means of scissors was performed on November 3rd, 1877, and a brief note of thirty lines recording the operation was published in the BRITISH MEDICAL JOURNAL, December 8th, 1877. He recommended the operation as having the following advantages over removal of the tongue by the ecraseur, galvanocautery, or knife: (1) Its extreme simplicity; (2) the prospect of a quick convalescence; (3) the control obtained by scissors in the direction of the cut and the amount of the tongue removed; (4) the absence of any sloughing, affording immunity from septic changes and lessening the risk of secondary haemorrhage. The point which he regarded as of most importance in the operation was that each snip must be short and alternately from one side to the other to avoid division of the larger arteries at the same time. The scissors which he used were the ordinary blunt-pointed kind with cutting portion about half the length of the handle. At one time he sent quite a large number of pairs away to surgeons who wrote asking for the exact description of the scissors he used.

In 1881 he read a paper before the Surgical Section of the International Medical Congress held in London, on excision of the tongue. It was published in the *Lancet*, October 22nd, 1881, page 1292, and reprinted in pamphlet form the same year. In the pamphlet he reported the results of 30 cases, more than half of which he had done himself, and 26 of which were from Manchester. The paper is an interesting summary of the subject. In it he refers to Billroth's operation which, quite unknown to him, was similar to his own in the use of scissors, but Billroth, as a preliminary, ligatured both lingual arteries to save haemorrhage. Whitehead snipped away without any such preliminary procedure and twisted every bleeding point. He practically never had any haemorrhage worth speaking of, either primary or secondary. His next paper on the subject was read before the Medical Society of London, April 27th, 1891. This was published in the BRITISH MEDICAL JOURNAL, May 2nd, and in the *Lancet*, May 9th, 1891. It dealt with 100 cases of excision of the entire tongue. Of the 100 cases, 66 were simple, uncomplicated excisions, and only 3 patients died. He used as an application to the stump of a tongue, after excision, a solution which came to be known as "Whitehead's styptic." It was composed of a saturated solution of iodoform in ether, with the solid ingredients of friars' balsam added. He recommended this strongly, maintaining that he kept his patients' mouths very healthy and sweet by its use.

The last paper which he wrote on this subject appeared in the *Practitioner* (May, 1903). It was almost entirely confined to a restatement of the essential features of his operation, but it included a description of the method which, as a result of long experience, he and his anaesthetist, Mr. Alexander Wilson, devised to get the patient into the best position for the operation. He used an ordinary rocking-chair, in which the patient was securely fastened by a roller or "Jack" towel in a way best understood by a study of the illustrations to the paper. The position of the patient when anaesthetized and ready for the operation was regulated by wedging two suitable pieces of wood beneath the rockers, one in front and the other behind. The whole story of the conception and development of this operation illustrates Whitehead's two chief characteristics, his desire for simplicity in method, and the attention he gave to minute practical details.

The original paper on the excision of piles was published in the BRITISH MEDICAL JOURNAL, February, 1882. In it he contended that internal piles were not distinct localized tumours, but component parts of a diseased condition of the entire plexus of veins, and that to effect a cure the whole of the affected mucous membrane, and not merely the tumours themselves, should be removed. The details of the operation are too well known to need relating here, but the important features, careful attendance to which is essential to success, may be pointed out. The first was that the greatest care must be taken to cut through the mucous membrane and not to cut the skin of the anus. Inattention to this was the cause of want of success in the hands of other surgeons who found that stricture sometimes ensued. If the mucous membrane alone were cut, he held that this would not happen, and as a matter of fact he never had a single case of stricture. The other point was, in removing the plexus of veins, to do it gradually, stitching after each successive snip the healthy mucous membrane, which was drawn down, to the ring of mucous membrane left above the anus. All haemorrhage was arrested by twisting. He pointed out that if the whole mass were removed before the sutures were put in there was a tendency for the mucous membrane above the cut to retract. The patients had their bowels opened on the fifth day and he allowed them to sit up next day.

At the annual meeting of the British Medical Association in Brighton (1887) he read a paper before the Section of Surgery on 300 consecutive cases of haemorrhoids cured by excision. He said: "I have now operated upon more than 300 patients without a death, a single instance of secondary haemorrhage, or one case where any complication, such as ulceration, abscess, stricture, or incontinence of faeces has occurred. I may go further, and state that I have never had one moment's anxiety about any of the cases, and, to the best of my knowledge, every patient has been completely and permanently cured" (BRITISH MEDICAL JOURNAL, February 26th, 1887, p. 448). In all he performed the operation some thousand times with invariably good results and no relapse or strictures.

He wrote the articles on affections of the mouth; the surgery of the thyroids; and, conjointly with Mr. Bilton Pollard, that on the surgical treatment of tumours and other obscure conditions of the bladder in Treves's *System of Operative Surgery, 1885.* He was one of the first surgeons in England to undertake the removal of the thyroid gland for cases of ordinary goitre.

Of his other new methods a modification of tracheotomy was perhaps the most important. The paper in which

it was described was published in the *Lancet* (April 30th, 1887), and was quoted in standard works in surgery. He used a raspatory to get down to the trachea after the incision through the skin and fascia. The operation was, he said, easy, required few instruments, and avoided haemorrhage.

When other means of treatment failed he was not above using empirical methods, formerly much in vogue amongst surgeons of a generation previous to his own. One of his last contributions to medical journals was the recommendation of seton as a cure for intractable migraine. (BRITISH MEDICAL JOURNAL, 1901, i, p, 335). He used this successfully in several cases of over five years' standing. One of the patients was a lady who was crippled by frequently recurring headaches which no doctor had been able to cure. He put a seton in the back of the neck over the last cervical vertebra, and although its presence was disfiguring his patient preferred it to the headaches. Another patient came specially from America to have the small operation done. He recommended the wearing of the seton for three months in the first instance, and its replacement if relapse occurred.

When mesmerism was much in vogue in the eighties, Whitehead took a keen interest in it, having seances at his own house, and he actually tried its anaesthetic effect for an operation on the knee.

For some years (1894–1900) he was Professor of Clinical Surgery in the Victoria University of Manchester, but he did very little teaching. About 1880 he was very keen on teaching, and, with other clinicians who were not on the teaching staff of the Owens College, contemplated the foundation of a rival medical school. He was to take surgery himself, James Ross, medicine, David Little, ophthalmology, A. H. Young, anatomy, and Henry Ashby, whose *Notes on Physiology* were then very popular, physiology, and others were to fill the remaining posts. They got so far as to take a convenient warehouse, and Whitehead had the key of this in his pocket. An advertisement promising, amongst other things, scholarships for the sons of medical men was actually drawn up. Then, full of his scheme, Whitehead went to London to consult his friend Sir William Savory on the necessary equipment of the school. On his return his ardour was seen to be damped, and, when asked about the interview, all that his friends could get out of him was, that in reply to his inquiry, Savory said: "Well, I suppose you will want a skeleton—and a microscope." For various reasons the scheme was dropped, the chief one being that Arthur Gamgee, then Professor of Physiology, and Dean of the Medical School, was considerably scared by the probable effect which the scheme would have on the College, and arranged for the addition of more clinical teachers to its staff.

In 1894, on the resignation of Professor Hare, the Chair of Surgery in the Owens College was divided, and Whitehead chose that of Clinical Surgery, for he then preferred the informality of bedside teaching to the more arduous work of regular instruction in the lecture theatre. His junior colleague Tom Jones took the Chair of Systematic Surgery.

In his later years there was a want of keenness in teaching, probably due to the fact that he felt his knowledge of the principles of surgery and their rapid changes was becoming deficient. At the bedside he could give most valuable advice on practical lines, especially to senior students and qualified men, and his ward classes were always well attended on account of his unconventional method of teaching, his great reputation, and his personality.

When the local members of the medical profession resolved to invite the British Medical Association to hold its Annual Meeting in Manchester, Mr. Whitehead was chosen President-elect, and accordingly he presided over the seventieth annual meeting held in 1902. The meeting owed not a little of its scientific and social success to his genial spirit and organizing powers. With characteristic loyalty to the city of his adoption, to the University, and to his old friends, he devoted his Presidential address to a discussion of Manchester's early influence on the advancement of medicine and medical education. The address showed much research, but was thought by some to have been too laboured for the occasion. To commemorate his Presidency, he printed for private distribution a well-illustrated and handsomely produced volume—*Some Apostles of Physiology*—compiled by his intimate friend, Dr. William Stirling, Brackenbury Professor of Physiology in the University of Manchester. It was a worthy memento of the occasion. Two hundred and fifty copies only were printed; some were presented to medical libraries and others he gave to friends, by whom the volume is much prized.

In his palmy days Whitehead had a very large surgical practice and enjoyed the reputation of a brilliant and bold operator. He was looked upon by people with awe as a surgeon who would not hesitate a moment to cut a leg off or a tongue out, and in less than no time, too, and who would do operations no one else would undertake. He certainly did tackle cases then which in later life he left to others. An instance of his boldness which impressed his then dressers took place in the late Eighties. In the removal of a large goitre very troublesome haemorrhage took place, so troublesome that even Whitehead had to ask the resident surgical officer to give a hand. Much of the bleeding came from a tear in the jugular vein. All measures to stop this having failed, he closed the tear with a pair of Spencer Wells forceps, and dressed the case with the handles protruding from the dressing. The forceps were to be taken off in two days, he told his house-surgeon; the latter diplomatically asked whether Mr. Whitehead would like to take them off himself. Certainly he would, and when the actual time arrived, and the dressers expected to see some delicate coaxing of the forceps, Mr. Whitehead simply unclasped them, and took them off as he would have done at an ordinary operation—and nothing happened. This case was that of a lady's maid, and the mistress, out of gratitude for the successful relief of her maid from the presence of a disfiguring and distressing tumour, sent Mr. Whitehead a cheque for £25. This he handed over to the committee of the infirmary with the suggestion that it might form a nucleus of a pension fund for nurses. As another instance of his boldness may be mentioned his pushing of morphine beyond the maximum official dose to relieve the pain of inoperable cancer. One of his patients took 30 grains of morphine three times a day during the last twelve months of life. This kept the pain off, without interfering with the patient's intellectual interest in his daily surroundings. This case was mentioned in his address to the Medical Society of London in supporting a protest against the timidity of the profession in giving more than the official dose of opium.

During his days of active work in Manchester his chief recreation was yachting, at first at sea off the coasts of Lancashire and Cheshire; after one or two rather perilous adventures in these waters he transferred himself to Lake Windermere, where he lived in a house-boat and took keenly to yacht racing. Later he took rooms on shore, and became the owner of a steam launch which in its day was one of the fastest afloat. While still retaining an interest in yachting on Windermere he acquired property at Colwyn Bay, and found great occupation in laying it out, making gardens and shrubberies on a hillside which did not at first sight appear particularly well adapted to the purpose. After retiring from active practice he spent more and more time at Colwyn Bay, and after his last fatal illness commenced residing there altogether.

It is not easy to sum up a life so full of variety and a character presenting some marked contrasts. Taking him all in all, he was probably the most original, and certainly the most widely known, of the surgeons Manchester has produced. If he had had a sounder knowledge of the principles of surgery, he probably would have had as brilliant a career as any English surgeon of his time. In his earlier days he had to work hard for his living, but during the last ten years of his connexion with the Manchester Royal Infirmary he was in very easy circumstances and had other interests which kept his pen idle. He had set about collecting cases for further papers on his special operations, but never completed this work. During his prime of life and, indeed, down to a somewhat advanced age, Whitehead lived what it is now the fashion to call a strenuous life; he worked hard and played hard—rather disposed to burn the candle at both ends. He loved his work as a surgeon and he loved yachting, and both he did with all his might. He loved cheery company and a good story, and was always one of the most cheery himself. He had, perhaps, an undue suspicion of academic

methods, and sometimes liked to shock a donnish person by a paradox, as when he said that the greatest drawback under which a surgeon could suffer was a knowledge of anatomy, since it made him timid. Yet one of the characteristics which impressed observers was his adaptability to changed conditions. He was a careful antiseptic surgeon when this view of the proper way of conducting operations prevailed, but when asepsis displaced antisepsis he adopted its principles and practised it at once. Many surgeons over 50 find it hard to break out of a groove.

He had a wide knowledge of the world and human nature, and this, with his intuitive instinct of what was best to relieve his patient, made him successful in his work, where a man of wider reading and deeper knowledge might easily have failed. When on the active staff of the Skin Hospital the first remark which he made to a youthful admirer who went to see him at his work was, "We don't diagnose here, we cure."

He was twice married; his second wife was a daughter of Mr. C. J. Schofield of Manchester, and he left one daughter by this marriage.

His brother, Mr. Henry Whitehead, High Sheriff of Lancashire in 1903, endowed a bed in the Manchester Royal Infirmary (1909) to commemorate his services to the charity.

William Smith, L.R.C.S.E., L.R.C.P.E., L.F.P. and S.G., of Potton, Bedfordshire, died on August 9th, at Potton, where he recently practised, and was buried on August 14th, at Caxton in Cambridgeshire, where his family are well known. He underwent a surgical operation at Sheffield about two years ago for malignant obstruction of the intestines, and recovered so well as to take up country practice again and even attend camp with the Bedfordshire Territorials, of which he was Surgeon-Lieutenant. Although the malady gradually returned, full of pluck and vitality he stuck to his work almost to the last, and only retired a month or two before his death. He began his medical career as assistant to the late John Benson, of Sheffield, whom he left in order to resume his studies, and take his diplomas in Edinburgh in 1900. Afterwards he served as civil surgeon during the Boer war; at the Station Hospital, Devonport, and the Station Hospital, Perth, where he was the guest at mess of the Black Watch. Afterwards he practised at Barton in Bedfordshire, Hawkesbury in Gloucestershire, in Shropshire, and finally at Potton. A general favourite with all whom he met, and a dear friend of many, remembered well by his sporting friends as a man who really loved a horse, his loss will be keenly felt by many at home, and a few of whom are now in the colonies, and all of whom will cherish the memory of "Billy" Smith.

Dr. Arthur Lee Wright, one of the vice-presidents of the American Medical Association in 1911–12, and one of the foremost surgeons of Iowa, died at the American Hospital, Paris, on July 19th, aged 62. He sailed for Europe with a number of members of the American Society of Physicians' Study Travel, intending to make a Continental tour before attending the International Medical Congress in London. In Paris Dr. Wright was taken ill with intestinal obstruction; an operation was performed, but he died four days afterwards. He was President of the Association of North-Western Railway Surgeons, of which he was one of the founders.

Dr. J. Byrne Hackett of Kilkenny, who died recently in that town, was born at Midleton, and received his medical education at the Ledwich School, Dublin. He obtained the diplomas of L.R.C.P.Edin. in 1868, and soon afterwards settled in practice at Kilkenny. He became surgeon to the County Infirmary, and medical officer to the workhouse and dispensary district. He had been for over twenty-five years Coroner for North Kilkenny, and was also coroner for the city. He took an active part in political life as a Parnellite, and in recent years had devoted considerable attention to the work of the Gaelic League and the industrial revival.

The number of the survivors of the Crimean War has been further diminished by the death of Deputy Surgeon-General Thomas S. Hollingsworth, who passed away at his residence in Spring Grove, Isleworth, on August 1st. He was born in July, 1828, and was thus in his 86th year. He received his professional training at University College Hospital, where he obtained medals for anatomy and biology. He passed the examination for the diploma of M.R.C.S. in 1851. He entered the Army Medical Service in November, 1854, and was shortly sent out to the Crimea; he received the English and Turkish medals with the Sebastopol clasp, as he was on duty during the siege of that place. He was also on duty in Scutari, where he saw the work of Miss Florence Nightingale and her nurses. From there he was sent to India, and subsequently was stationed at the Cape and Mauritius; his last years of service were spent in India. He leaves a widow, whom he married since his retirement. He has remembered the hospital at which he was educated by leaving it a legacy of £100.

Surgeon-Colonel Samuel Bradshaw Hunt, of the retired list, Madras Medical Service, died at Limerick on July 24th. He was educated in the school of the Royal College of Surgeons, Ireland, took the diplomas of L.R.C.S.I. and L.R.C.P.Edin. in 1864, and entered the Indian Medical Service on April 1st, 1865, being one of the first batch commissioned after the service had been closed for nearly five years. He became Surgeon on July 1st, 1873, Surgeon-Major on April 1st, 1877, Brigade Surgeon on August 26th, 1886, and Surgeon-Colonel on March 1st, 1893. He retired after the usual five year tour in that rank on March 1st, 1898. His first ten years' service was spent in native regiments, chiefly in the 7th Madras Infantry. On December 9th, 1876, he was appointed surgeon to the Bodyguard of the Governor of Madras, and held that appointment for nearly twenty years till his promotion to the administrative grade. During this time he was twice on furlough—in 1878–79 and in 1890–91—and for a short time, in 1882, surgeon of the hill station of Coonoor. From 1884 the post of surgeon of the 3rd District of Madras was continued with the charge of the Bodyguard. As assistant medical officer, he served first in the Rangoon district, afterwards in Bangalore and the Southern district; and in 1895 acted for a time as principal medical officer of the Madras Command with the temporary rank of surgeon-general. The Army List assigns him no war service.

Surgeon-Colonel John Richardson, Bengal Medical Service, retired list, died at Totland on August 13th, 1913. He was born on February 26th, 1837, educated at King's College, Aberdeen, where he took the degree of M.A. in 1856, and that of M.B. in 1859, and at University College, London, and after taking the L.R.C.S. and L.R.C.P. of Edinburgh, entered the Indian Medical Service as Assistant Surgeon on July 27th, 1859. He became Surgeon on July 27th, 1871; Surgeon-Major on January 1st, 1873, Brigade-Surgeon on April 29th, 1887, and Surgeon-Colonel on May 19th, 1889, retiring on May 19th, 1894. While serving in the army he took part in the Bhutan Expedition of 1864–65, and was present at the capture of Buxa and of the Bala pass, and at the storming of the stockades above the pass, receiving the medal and clasp. In 1866 he entered the Sanitary department in the North-West Provinces as Deputy Sanitary Commissioner, subsequently becoming Sanitary Commissioner, and in 1883 took the diploma in Public Health at Cambridge. In May, 1889, he was appointed Administrative Medical Officer of the Central Provinces, and in March, 1890, Inspector-General of Civil Hospitals in the North-West Provinces, where he was a very popular and also a strong head of the medical department of that province. In 1887 he represented India at the Sanitary Conference at Venice, and in 1897 he served on the Indian Famine Commission, and for ten years—July, 1896, to July, 1906—was a member of the Army Sanitary Commission. He was appointed Honorary Physician to the King on September 26th, 1903.

Deaths in the Profession Abroad.—Among the members of the medical profession in foreign countries who have recently died are Dr. J. M. Aguilar, professor of gynaecology in the Medical Faculty of Granada; Dr

Bourget, professor of clinical medicine in the University of Lausanne; Dr. Henry Jacques Garrigues, for some years professor of obstetrics in the New York Post-graduate Medical School, and professor of gynaecology and obstetrics in the New York School of Clinical Medicine, and consulting surgeon to several special hospitals in New York, aged 82; Dr. Karl de Gheldere, of Couckelaere, a distinguished Flemish poet and a well-known practitioner of medicine; Dr. Warren Nichols Horton, professor of genito-urinary diseases in the College of Physicians and Surgeons of Los Angeles, aged 32; Dr. Edward Everett Hyde, assistant editor of the *Journal of the American Medical Association*, aged 38; and Dr. Horace Jayne, professor of vertebrate anatomy and secretary of the Faculty in Biology of the University of Pennsylvania, aged 54.

Universities and Colleges.

UNIVERSITY OF OXFORD.

THE following candidates have been approved at the examination for the Diploma in Ophthalmology:

Harriet R. D. Ford, D. Horgan, K. N. Karanjia, G. C. L. Kerans, G. H. Oliver, D. D. Paton, A. C. Reid.

UNIVERSITY OF LONDON.

THE following candidates have been approved at the examination indicated:

FIRST M.B.—G. Adler, R. D. Aylward, S. E. Barraza, M. Ba Thin, J. C. Blake, H. J. Blampied, J. E. A. Boucaud, G. Bourne, N. J. Boxall, C. H. Bracewell, H. W. Breese, C. H. Brew, R. B. Britton, Elsie C. Bulley, Ellinor M. Burnett, F. Caldecott, D. Cameron, D. G. Churcher, H. J. C. Churchill, W. E. Le G. Clark, A. J. Cokkinis, E. V. Corry, W. A. Date, C. O. Davies, G. V. Davies, E. F. Deacon, Phyllis D. Dixon, H. L. Douglas, M. Edwards, D. W. Evans, Grace H. Ewart, W. Feldman, L. A. R. Gaud, J. Gay, M. W. Geffen, Nannie Gibson, Dorothy Gilford, E. H. Glenny, H. Gluckman, *E. Glynne, Alice M. Griffiths, H. G. Hall, J. Hardy, C. G. Harper, L. W. Hefferman, Bertha Hinde, E. C. Hinde, G. F. W. Howorth, N. R. Jenkins, H. C. C. Joyce, Amy M. Kerr, J. I. Kühne, F. R. Leblanc, L. K. Ledger, Emily C. Lewis, P. T. Liang, G. P. Lindsay, Alice L. Lloyd-Williams, W. A. Low, K. McFadyean, B. Maclean, T. H. McLeod, B. G. Marshall, C. L. Mason, F. Morcos, E. R. D. Nagel, M. H. Oldershaw, A. E. P. Parker, A. E. B. Paul, E. D. Pridie, H. N. Pritchett, W. R. Ranson, Olive Rendel, J. C. R. Richardson, G. F. Rodrigues, Gwendolen M. Rolfe, J. P. Ross, H. Rowan, W. H. Royal, Eleanor M. Scarborough, S. C. Shaw, M. B. Tench, B. Thomas, D. J. Thomas, *J. H. Thomas, G. E. Tilsley, C. M. Titterton, A. R. Tothill, R. W. Twining, A. J. Usborne, R. Walters, S. A. T. Ware, F. W. A. Watt, A. Whiteway-Wilkinson, I. G. Williams, S. C. Woodhouse, Irene Yates, F. Young.

SECOND M.B.—(*Part I*): G. C. Agarwala, J. R. Banks, Grace M. Beaven, H. F. G. Berncastle, Alethea J. Bolton, G. W. J. Bousfield, O. C. Carter, P. C. L. Carrier, J. D'A. Champney, P. S. Clarke, P. N. Cook, Dorothy T. Daintree, R. C. Davenport, J. M. Davey, A. N. M. Davidson, G. Day, J. D. Dyson, A. W. F. Edmonds, C. F. Eminson, L. B. Goldschmidt, H. O. Gunewardene, Iris Harding, A. R. Hart, G. W. Heckels, Blanche A. M. Henderson, W. A. Hewitson, C. A. Hutchinson, J. W. D. Hyde, Helen Ingleby, J. Joffee, S. R. Johnston, V. E. Jones, M. H. K. Kane, G. E. Kidman, C. A. Kirton, E. E. Lightwood, Marguerite F. J. Lowenfeld, Ethel M. McCartney, M. H. MacKeith, H. I. Marriner, A. Morford, A. H. Morris, J. J. Murphy, N. Olivier, Irene G. Parsons, E. F. Peck, V. J. Perez y Marzon, E. S. Phillips, B. H. Pidcock, Sybil M. G. Pratt, T. D. Pratt, S. H. de G. Pritchard, C. N. Read, J. B. Reed, P. R. Riggall, H. B. Russell, M. Shimberg, Ellen Syik, A. L. Telling, A. A. Thiel, N. B. Thomas, R. E. S. Webb, A. W. Wells, Effie A. Wharton, G. S. Wilson, C. Young.

* Passed with distinction in one or more subjects.

UNIVERSITY COLLEGE, LONDON.

THE vacancy in connexion with the department of chemistry, created by the resignation of Dr. W. C. McC. Lewis, has been filled by the appointment of Dr. R. E. Slade. The further vacancy on the staff of the college, caused by the election of Dr. A. J. Clark, assistant in the department of pharmacology, to the lectureship on this subject at Guy's Hospital, will be filled at the beginning of next session.

KING'S COLLEGE HOSPITAL.

As the authorities of King's College Hospital expect in the new quarters at Denmark Hill much more work than in Portugal Street, several additions have been made to the staff, these including the appointment of Sir Ronald Ross as physician for tropical diseases. The staff of the medical school has also been considerably increased.

Prize Awards.

As the result of the examinations recently held, the following awards have been made: The senior scholarship and the prize for diseases of children to Mr. C. F. Hacker; the prizes in obstetric medicine, forensic medicine, and clinical surgery to Mr. F. H. Mosse; the *Todd* prize and the *Tanner* prize to Mr. E. W. Carrington; and the prize in medicine to Mr. A. E. Panter.

SOCIETY OF APOTHECARIES OF LONDON.

THE following candidates have been approved in the subjects indicated:

SURGERY.—*†S. H. Andrews, *†P. R. Cross, *†G. E. Cuttle, *†C. Duncan, *† H. E. B. Finlaison, *†A. Lowndes, *W. E. Masters, *†S. E. Murray, †T. B. Paul.

MEDICINE.—*†T. H. Cresswell, †G. E. Cuttle, *C. Duncan, *†W. E. Masters, *S. E. Murray, *†T. B. Paul, *C. E. Reckitt.

FORENSIC MEDICINE.—L. B. Clarke, G. E. Cuttle, H. Dudley, C. Duncan, W. E. Masters, S. E. Murray, W. Smith.

MIDWIFERY.—C. Duncan, G. W. Maw, W. E. Masters, H. Morrison, S. E. Murray, W. Smith.

* Section I. † Section II.

The diploma of the society has been granted to Messrs. S. H. Andrews, G. E. Cuttle, H. E. B. Finlaison, A. Lowndes, and T. B. Paul.

Public Health AND POOR LAW MEDICAL SERVICES.

COMPENSATION FOR LOSS OF OFFICE.

J.—The only valid reason for including the salary for medical inspection of school children received from the county council in the total amount claimed for compensation as loss of office would be that a smaller salary was given as medical officer of health owing to the receipt by him of fees from the county council for school work.

CLEANSING OF VERMINOUS CHILDREN.

P. G.—The carrying out of Section 122 of the Children Act, 1908, which provides for the cleansing of verminous school children, is in the hands of the school medical officer or any person provided with his authority in writing. It is competent for such authorized person to give evidence in a court of justice in connexion with legal proceedings taken under the section. A conviction might more certainly be obtained if it were possible to obtain evidence from a registered medical practitioner.

Medical News.

Two courses of demonstrations, the one on selected surgical cases of special interest, and the other on subjects of clinical medicine, began last Monday at the London Hospital, and will continue daily except on Saturdays until the end of September. The demonstrations are timed for 2 p.m. and 2.15 p.m. respectively, and are free to all qualified practitioners.

AT the annual meeting of the Association for the Oral Instruction of the Deaf, under the presidency of Captain H. M. Jessel, M.P., the Rev. C. H. Parry presented the annual report for 1912, and its adoption was moved by the Chairman, who spoke of the benefit which had accrued to the deaf—no longer of necessity dumb—by the oral and lip-reading method since its introduction into this country by the late Mr. Van Praagh. The official recognition by the Board of Education of the training college for teachers and the institution of examinations for the teachers' certificate jointly by that Department and by the Joint Examination Board for Teachers of the Deaf had placed professional training on a more stable and satisfactory footing, and he was glad to say that for the fifth year in succession a Fitzroy Square student headed the pass-list. It was hoped that the amalgamation with the Ealing College would soon be achieved, and from this fusion a single training college, sufficiently equipped to keep up the supply of teachers to the fifty or more schools for deaf children in various parts of the country, would arise. The initial expense would, however, be large—not less than a capital sum of £15,000, with an increased income for maintenance. These were ambitious aspirations, but he trusted they would be carried into effect. An interesting demonstration of the mode of imparting instruction to deaf children of varying ages was subsequently given by Mr. G. Sibley Heycock, director of the school at 11, Fitzroy Square, and specimens of manual and other school work, some of it extremely well executed, were on view in the room. Mr. Heycock pointed out that the profession of oral teacher of the deaf was at present understocked, and after two years' training, which could be had by intelligent and well-conducted young men and women at a very moderate cost, might be depended on for a very respectable livelihood. The proceedings closed with a vote of thanks to the Chairman, moved by Mr. St. John Ackers, representing the Ealing Training College.

Letters, Notes, and Answers.

ORIGINAL ARTICLES and LETTERS *forwarded for publication are understood to be offered to the* BRITISH MEDICAL JOURNAL *alone unless the contrary be stated.*

MANUSCRIPTS FORWARDED TO THE OFFICE OF THIS JOURNAL CANNOT UNDER ANY CIRCUMSTANCES BE RETURNED.

CORRESPONDENTS not answered are requested to look at the Notices to Correspondents of the following week.

CORRESPONDENTS who wish notice to be taken of their communications should authenticate them with their names—of course not necessarily for publication.

AUTHORS desiring reprints of their articles published in the BRITISH MEDICAL JOURNAL are requested to communicate with the Office, 429, Strand, W.C., on receipt of proof.

TELEGRAPHIC ADDRESS.—The telegraphic address of the EDITOR of the BRITISH MEDICAL JOURNAL is *Aitiology, Westrand, London.* The telegraphic address of the BRITISH MEDICAL JOURNAL is *Articulate, Westrand, London.*

TELEPHONE (National):—
2631, Gerrard, EDITOR, BRITISH MEDICAL JOURNAL.
2630, Gerrard, BRITISH MEDICAL ASSOCIATION.
2634, Gerrard, MEDICAL SECRETARY.

☞ *Queries, answers, and communications relating to subjects to which special departments of the* BRITISH MEDICAL JOURNAL *are devoted will be found under their respective headings.*

ANSWERS.

RED CROSS COMMANDANT.—The Red Cross Manuals Nos. 2 and 3 should be almost sufficient for Red Cross nurses. For improvization work Mackay's *Improvised Methods of Aid in the Field*, published by Eyre and Spottiswoode at 1s. 6d., might be studied. For nursing duties Domville's *Manual for Hospital Nurses*, published by Churchill at 1s. 6d., and McIsaac's *Primary Nursing Technique*, published by Macmillan at 3s., should be useful. If less elementary or more detailed information is desired the ordinary nursing textbooks for trained nurses must be got, and these are not supposed to be necessary for voluntary aid work.

LETTERS, NOTES, ETC.

NURSES AND TRACHEOTOMY.

MR. MORLEY ROBERTS writes: As I have only just seen your paper's criticism of July 19th on my story, "Holloway's Corot," which appeared in *The Strand Magazine*, perhaps you will allow me to reply to it. The reviewer deems it extraordinary for me to make the doctor think that the nurse, in the absence of proper professional aid, ought herself to have done a tracheotomy in so desperate a case. As the child in question was actually moribund, and as the doctor who did operate was there by chance, this seems to imply that in any case she should have let it die rather than trench on surgical prerogative. Your reviewer does me the honour to say that I seem to know more of surgery than most lay writers. Having also some slight knowledge of the theory and practice of nursing I feel sure that most members of the medical profession would agree with me that in such a case as the one of which I wrote a nurse, who had received a proper training of at least three years, should risk doing an operation, which she should certainly have seen done, rather than let her patient die unnecessarily on a mere point of etiquette. If the surgeon, who had been unable to get to the case in time to assume full responsibility, had to deal on his arrival with her possible mistakes in technique, he could at any rate be in a position to do more than merely notify the coroner. I may add that the story in question was placed in the country, and at some distance from a town. Of course, such an emergency could not easily arise in London.

*** A nurse can only be expected to do the work for which she is trained. The performance of tracheotomy is no part of that training. As any medical man would tell Mr. Morley Roberts, tracheotomy in the circumstances described in his story requires all the skill of a surgeon who can use the knife as deftly as our correspondent uses the pen.

INTERNATIONAL CO-OPERATION.

DR. GEORGE PERNET (London) writes: In your review (BRITISH MEDICAL JOURNAL, August 9th, p. 320, col. ii) of the German translation of Darier's work on diseases of the skin annotated by Jadassohn, the following passage occurs: "On the other hand, it is a new departure, and very interesting, to see the opinions of two great European authorities . . . chronicled side by side in the text. . . ." May I point out that this is not a new departure? Some years ago now Kaposi's *Diseases of the Skin* was done into French by Doyon and annotated by the great clinician, Besnier.

THE ADVANTAGE OF THE "SQUATTING" ATTITUDE IN DEFAECATION.

P. A. T. writes: The "squatting" closet to be seen at the exhibition in connexion with the International Congress, based on the idea that the attitude naturally adopted by uncivilized man was intended, amongst other things, to prevent hernia, is, as any one can prove for himself, one of those airy, scientific assumptions that have only to be put to the test to be at once exploded. In this attitude, the apposition of the fleshy part of the thigh with the abdominal walls is at its very weakest, and if there is any mechanical predisposition to hernia at the external abdominal ring, it could not be prevented. The fingers can be placed between the thighs and the abdomen at this spot without any sense of pressure such as would be required to prevent a hernia forcing its way out, as it does, downwards and inwards. As can be seen in anatomical diagrams, the tendons of the adductor muscles and gracilis, the muscular portions of which must be relaxed in this attitude, cannot possibly close the outlet of the ring; and certainly there is nothing to appose the umbilicus! On the other hand, the greatest pressure on the abdominal walls occurs by the apposition of the quadriceps and sartorius muscles supported by the femur on the outer halves of the lower part of the abdomen, tending to increase the internal abdominal pressure and thus actually help to produce a hernia if predisposed!

But, sitting on the ordinary closet seat, the mechanical conditions tending to prevent hernia are enormously improved by the fact that when leaning well forward the weight of the body rests almost entirely on the fleshy parts of the thighs, just below the glutei. Hence the muscles internal to the femur are powerfully thrust forward to help to close the inguinal ring; and thus they might be successful in preventing the exit of an incipient hernia due to undue straining.

Therefore, before wasting money on expensive designs based on pure assumption—Experiment.

Undue straining is not always caused by constipation—that is an insufficiently frequent action of the bowels—but may occur in those whose rectum is unduly enlarged above the sphincter, so that the first part of the motion tends to be unduly large as well as hard. But I have found a very simple device to prevent the straining in such cases—with the fingers protected with a piece of paper, firm pressure below the coccyx will soon shift and dislodge this initial obstruction, and people who come complaining of constipation or straining should be told of this.

HERPES AND VARICELLA.

DR. ARTHUR Z. C. CRESSY (Wallington, Surrey) writes: I must say I read the correspondence concerning chicken-pox following shingles with much unbelief, but a fortnight ago a patient called on me and showed me a large patch of shingles on her side. I told her of the cases reported, and asked her to see if her children developed chicken-pox in fourteen days. To-day (fourteen days exactly) she asked me to see her little daughter, and I found the child suffering from a smart attack of chicken-pox. I have not seen any theory put forward to account for this seeming coincidence. I suppose I am right in assuming that shingles is caused by inflammation of the trunk of a nerve. Could not the vesicles of chicken-pox be produced by inflammation of the terminals of the sensory nerves to the skin all over the body?

DR. JAMES D. HALSTEAD (Burnley) writes: It would be interesting if some of your readers would record their experience during the last few months with regard to herpes zoster. There would appear to be prevalent at present a mild epidemic of the disease, as within the last month I have had four cases—one in a middle-aged adult on the Yorkshire coast; another in a male, aged 30, in the West Riding; and two cases, aged 10 and 4 respectively, in North Devon. Perhaps if any of your readers are meeting with a similar abundance of these cases in general practice at present they will record their experience, as it will do much to establish the acute specific epidemic character of this ancient but still obscure disorder.

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